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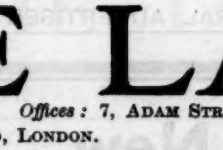


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# ADDRESSES AND ORIGINAL ARTICLES

## MENTAL ILLNESS AS A CLUE TO NORMALITY

BY STEPHEN TAYLOR, B.Sc., M.D. Lond., M.R.C.P.

SURGEON LIEUT.-COMMANDER (NEUROPSYCHIATRIC SPECIALIST) R.N.V.R.; FORMERLY ASSISTANT MEDICAL OFFICER AT THE MAUDSLEY HOSPITAL (L.C.C.), AND HOUSE-PHYSICIAN, BETHLEM ROYAL HOSPITAL

To most doctors mental illness is still something quite apart from everyday experience. The insane are separated from the sane by a clearly defined barrier, and, once this is passed, the patient, being no longer a rational individual, must be isolated from his fellows and placed under the constant care of a specially trained staff. The delusions, the hallucinations, and the strange behaviour seen in mental hospitals seem to bear little relation to the ordinary workaday world. Yet it is becoming commonplace for psychiatrists, especially those working on early mental illness, to regard this divorce from normality as an artefact, fostered by the demonstration of the grossly insane to the medical student and the isolation of the average mental-hospital doctor from the out-patient clinic. The modern psychiatrist thinks of mental illness rather as a caricature of one or more aspects of the sane mind. We can regard insanity as an informative experiment by nature in which certain normal personality traits are repainted in crude colours.

The points which it is hoped to establish in this paper are as follows:—

(1) The division of mental illnesses into two distinct classes, the neuroses and the psychoses, is not justified by the observed facts.

(2) A gradual transition exists between every variety of mental illness and normality. He who seeks may find the intermediate types.

(3) A similar transition may be found between the different mental illnesses themselves. The average psychiatric syndrome is a mixed picture of two or more reaction types, though one as a rule predominates.

(4) Inasmuch as each mental illness represents a caricature of normality, it is both possible and profitable to analyse the basic personality of the normal individual in these terms.

(5) There is evidence to suggest that the exaggerations of personality in mental illness may be biochemically determined. Equally then, the normal basic personality may be biochemically determined.

(6) The rapid growth of knowledge of psychopathology has tended to obscure the study of the basic personality, as revealed by the investigation of mental illness. Psychopathology emphasises environmental changes, especially those in early years, as factors in character-formation. It neglects the inherited mental material on which the environment acts. Psychopathology is not in itself a determinant of conduct. Rather does it determine the individual way in which the basic personality manifests itself. Psychiatry and psychopathology are not antagonists but partners in explaining the workings of the mind.

Some of these points are regarded as common knowledge by certain psychiatrists. Others regard them as fundamentally false. For this reason, detailed evidence for each contention must be given. Further, since the concern of this paper is as much with the normal mind as with the disease, the non-psychiatric reader must be considered; it will therefore be necessary to describe much with which the psychiatrist is familiar.

### NEUROSES AND PSYCHOSES

The view that mental illnesses cannot be sharply divided into two groups, the neuroses and the psychoses, is rapidly gaining ground. The evidence on which this division was formerly based may be summarised thus:—

(1) Neurotic patients have insight into their illness while psychotic patients do not.

(2) The ætiology of the neuroses is mental—in the realm of psychopathology—whereas that of the psychoses is constitutional or physical.

(3) The neuroses can be treated successfully by psychotherapy and environmental adjustment, whereas the psychoses cannot.

In practice each of these lines for differentiation is found to break down continuously.

(1) *Insight.*—Few grossly hysterical patients have, or can be made by any psychotherapeutic procedure to have, true insight into their illness. On the other hand, many early schizophrenics seek medical aid precisely because their insight is so clear that they are alarmed by their symptoms. Melancholics too have enough insight to realise that they are mentally ill and in need of treatment, but, though better off than the hysterics, their insight is seldom complete, for they view the outlook as irretrievably hopeless. In mild depressive illnesses even this partial impairment of insight is absent. The fallacy of insight as a differentially diagnostic touchstone has been delightfully exposed by Curran (1937a).

(2) *Ætiology.*—In the course of any disease, be it mental or physical, two sets of factors must be considered, the constitutional and the environmental—the old-fashioned soil and seed. The constitution may be so weak that it breaks down spontaneously, or the environment so difficult that the finest constitution cracks, but in most illnesses both factors operate. The case for the psychological or environmental origin of the neuroses is as follows. Early environmental stresses so affect the mental make-up that subsequent environmental strains lead to anxiety, hysterical, or obsessional reactions. The evidence for this hypothesis is obtained by psycho-analysis, Freudian or otherwise. The psychopathological explanation of the morbid processes are so well substantiated that the unbiased observer is inevitably impressed. But the analysts themselves admit that in minds of normal people—e.g., student analysts—precisely similar processes are at work without causing symptoms. Further, in severe depressive and schizophrenic illnesses, for which only extremists claim a psychopathological causation, symptoms are often clearly explicable in terms of psychopathology.

Mr. A., aged 47, a supervisor in a large commercial undertaking, developed a severe depressive illness. Ten years previously he had married a clerk in his office, some years his junior. She was a hysterical personality and submitted with reluctance and frigidity to sexual intercourse. After the birth of two children she refused further intercourse, and the patient for seven years indulged in manual masturbation. At the outset of his depression he was filled with guilt about his conduct and, as he became worse, told everyone that he was a sexual maniac. Still later he announced that his trouble was really due to his wife's being a sexual maniac.

The psychopathology of this case might briefly be described as disappointment and dissatisfaction with sex life, repression, guilt to shield himself from his

wife's shortcomings, and finally inversion to shield himself from his own desires. That these hidden emotions played their part in the symptoms and possibly the onset of the illness is not denied; but that they alone caused the condition is extremely improbable, especially since the family history was positive and the patient had had a previous attack of depression at the age of 30.

We have then to ask ourselves if there is any evidence as to why some people, when subjected to difficult infantile and adult environments, react in a so-called "neurotic" manner, while others in the same environments do not. That a constitutional factor is operative is suggested by the following quotation:—

"A group of hysterics who were pathological liars were compared with the average population in respect of the proportion of their brothers and sisters who were in mental hospitals: it was five times as many; and of the parents of the group a sixth were psychopathic" (Mapother and Lewis 1937).

Of the obsessional disorders, the same authors say:

"The hereditary factor is strong. A third of the parents of obsessional patients, and a fifth of their brothers and sisters, have themselves shown pronounced obsessional traits; and the proportion is in each case higher if all forms of mental abnormality be included, since both schizophrenia and affective illnesses occur with more than average frequency in families of obsessionals."

As these authors point out, parental abnormalities may equally be an environmental factor; but, at the same time, many children react strongly and in the opposite direction to obsessional activities in parents. It appears then that hereditary or constitutional factors are operative in the so-called neuroses, even as they are in the so-called psychoses. Further, just as an acute environmental situation may precipitate a neurotic reaction, so equally it may push a patient over into psychosis. An unhappy love affair may preface schizophrenia or a business calamity melancholia.

If we wish to obtain an honest picture of the ætiology of any mental disorder, be it hysteria or paranoia, we must assess, by a study of the family and personal history and of the environment from birth to illness, how far the basic mental material is faulty, and how far outside circumstances have contributed to the illness. As a broad speculation, with admittedly many exceptions, one may suggest that schizophrenia is 90 per cent. constitutional and 10 per cent. environmental, melancholia is 80 per cent. constitutional and 20 per cent. environmental, the obsessional states 70 per cent. constitutional and 30 per cent. environmental, hysteria 60 per cent. constitutional and 40 per cent. environmental, and the anxiety states 30 per cent. constitutional and 70 per cent. environmental.

(3) *Treatment.*—The last alleged mode of differentiation between the neuroses and the psychoses is the success of psychotherapy and environmental adjustment with the one and their failure with the other. Here, unfortunately, it is impossible to give a dogmatic answer. In the first place, most psychotherapeutists admit that chronic, stupid, or elderly hysterics are beyond their power to treat. Secondly, both neuroses and psychoses are liable to recover spontaneously. This was well shown by Curran (1937 b). He followed up 83 psychiatric outpatients at St. George's Hospital, London, over one to three years and found that 51 were "improved" or "greatly improved" without anything in the nature of intensive psychotherapy. This recovery-rate does not differ greatly from the figures of Luff and Garrod (1935) at the Tavistock Clinic (55 per cent. "improved" or "greatly improved" after three years) and of Ross (1936) at the Cassel Hospital (70 per cent. "improved" or "greatly improved" after one year) using more intensive psychotherapy. The figures are not, however, strictly comparable, inasmuch as the cases subjected to psychotherapy were selected. Until adequately controlled series show that more neurotics recover with psychotherapy than with simple observation, we must remain in doubt. At the same time, psychotherapeutic and environmental changes often appear to produce beneficial results, even in gross psychotics. The catatonic schizophrenic will sometimes make a great social improvement if forced to associate with active workers on a mental-hospital farm. Efforts at treatment are not to be condemned. Patients with mental illness cry out for help, and though there is no proof that we can help them by psychotherapy, our clinical impressions, even if emotionally biased, justify our continuing to try.

To summarise, we may say that there does not seem to be a single fundamental way in which the neuroses differ from the psychoses. If the two terms mean anything, it is this: in the neuroses the environmental causes bulk larger than in the psychoses. Yet even in the neuroses, constitution may still be more important than environment.

### INTERRELATIONS OF MENTAL ILLNESSES

There are, broadly speaking, eight main types of reaction in mental illness: mania, melancholia, anxiety, schizophrenia, paranoia, the confusional states, hysteria, and the obsessional state. Each occurs in pure form, which will be described in due course, but in addition each may show secondarily features of the others.

For example, when a hypomanic personality becomes depressed, hysterical features are common. Similarly, young depressives often show schizophrenic features, such as hallucinations, thus complicating both diagnosis and prognosis. Again, obsessional symptoms may be a manifestation of depression and will therefore speedily vanish when the depression spontaneously recovers. Should psychotherapy have been employed a spurious cure of an obstinate illness may be claimed. Bizarre obsessions may be the presenting symptoms of schizophrenia. Paranoid reactions are seen in manics, melancholics, and schizophrenics. Manics and schizophrenics too may behave hysterically, and anxiety may be the most prominent symptom of a true depressive illness.

From the point of view of both prognosis and treatment it is obviously important to decide which is the primary mental reaction and which are secondary; but sometimes such a decision is impossible. The infinitely close series of gradations between two types of mental reaction is most obvious in schizophrenia and paranoia. It is possible to find every variety of patient intermediate between paranoid schizophrenia and paraphrenia, and between paraphrenia and pure paranoia. Similarly, acute mania and excited catatonia may present an identical clinical picture on cross-section. Anxiety states, too, merge imperceptibly into depressions.

Mr. B., a farmer, aged 54, complained of typical anxiety symptoms for eleven months. He had a substernal tense feeling, as though something, he knew not what, was going to happen. He denied stoutly that he was depressed, though he admitted he was irritable and worried. He could not understand it, for he had not a care in the world. Just before the attack came on, he had felt fitter than he had for years

and had taken part in the hay-making with astounding vigour. In fact, his wife attributed his breakdown to overwork and strain at this time. He was not retarded, had no delusions of guilt, had talked of suicide, but said he had no serious intentions.

Such a condition might justifiably be described as an anxiety state, but further investigation revealed the following facts. His father suffered from depression with hypochondriacal delusions at the age of 80, and from this he made a good recovery. One brother and one sister were in mental hospitals with depressive illnesses, and another sister was liable to phases of depression since the death of her son in an R.A.F. crash. The patient himself had, since the age of 30, been liable to attacks similar to, but milder than, the present one at intervals of three to five years. Each attack lasted a few weeks to a few months. The patient was an energetic, successful, and happy man, without an enemy in the world.

In view of the positive family history, the previous attacks, the hypomanic prepsychotic personality, and the absence of precipitating factors, there can be little doubt that this apparent anxiety state was really a true but mild endogenous depression.

We are now in a position to review the eight main types of mental reaction in detail, to see if in fact each does represent a caricature of a facet of normality, and to consider whether so-called normal behaviour becomes more intelligible after such a study.

### MANIA

Full-blooded mania is rare. Mild hypomania, on the other hand, is extremely common. The essential features of mania are as follows :—

(1) *Mood.*—This is usually happy in spite of the environment, which may be the refractory ward of a mental hospital. The jollity is infectious but soon palls and becomes boring. The mood is labile, and tears flow easily but soon dry. Some manics are charming, but others often or always querulous. And their endless complaints are based on a minutely accurate observation.

(2) *Thought* is rapid and at times liable to such jumps that the thread is apparently lost. The flight of ideas is determined by associations both within the mind and in the environment, and as a result the manic is extremely distractible. He notices and remembers everything, and his knowledge of hospital and world affairs is astonishing. But in the wealth of detail major judgments become faulty.

(3) *Energy and activity* are increased, sometimes enormously. Psychomotor, intellectual, and association tests show that, while the apparent quickness and capacity of the manic are less than normal, those of the hypomanic are sometimes greater. Perseverance is usually lacking but is sometimes astonishing. Schemes for local and world improvement are evolved with ease and often with complete disregard for practical difficulties. Sleep is brief, but lack of it does not worry him. Sexual desire is at first heightened but potency lessened.

So close to one aspect of normality is mania that certification is often very difficult. Indeed, the psychiatric patient who will "complain of" nothing is usually a manic—or a schizophrenic. Repaint the picture in slightly less obvious tones, and a host of familiar normalities appear. The tramp singing as he swings along the road content with his lot, the busy surgeon doing ten operations in an afternoon and wisecracking with his students, the city magnate and the politician knowing every detail of a vast organisation and planning yet greater conferences or sales campaigns, and the club bore with his endless anecdotes and a fresh one for each distraction in his steady stream make up the great concourse of the mild hypomanics. At times invaluable and at times intolerable, the hypomanics behave, no less than the manics, according to a pattern. If we recognise in the one a definite disease which no amount of effort on the patient's part will conquer, so in the other we must recognise a mode of behaviour as strongly determined as the features of the face.

Just as in the physical examination of a patient it is possible to assess roughly the degree of enlargement of the liver or spleen although exact measurement is impossible, so in psychiatry one can give a rough estimate of the degree of manic behaviour of a patient. At one end is mild hypomania, a manifestation of normality, while at the other is severe mania, an obvious disease. Even in the absence of a unit of behaviour, a rough quantitative assessment of mania is of practical value. It will be seen that the same holds for the other types of mental disease reaction.

*Causes of manic and hypomanic behaviour.*—Kretschmer (1925) has observed that affective psychoses are commoner in the so-called "pyknic" constitution —the type of stocky build, with short massive neck, large body cavities, a tendency to fat on the trunk, especially its lower part, and slender extremities tapering to small hands and feet. Mayer-Gross and Slater (1938) summarise the findings of most workers by saying that 25 per cent. of patients with affective psychoses are pyknics against 12 to 15 per cent. in the average population.

There are three states of known causation in which manic or hypomanic behaviour occurs. The first of these is an infective process—namely, one type of general paralysis of the insane—while the other two result from taking two chemical substances, alcohol and benzedrine. The euphoric general paralytic is, like the true manic, becoming increasingly rare ; and there is evidence that the condition is likely to develop in persons who previously showed hypomanic tendencies. In his flight of ideas, easy distractibility, and grandiose schemes divorced from reality the euphoric paretic simulates mania closely enough to cause at times diagnostic difficulties ; but, sooner or later, signs of confusion and dementia manifest themselves. Nevertheless, the similarity in the clinical picture is close enough to suggest that in both some specific portion of the nervous system is functionally deranged.

Increasing doses of alcohol may also simulate extremely closely the progress from hypomania to mania, though, as in general paralysis, confusion ultimately results. In some people and on certain occasions alcohol admittedly produces depression ; but the usual sequence is elation, with flight of ideas, temporary increased efficiency followed by diminishing efficiency in spite of excessive confidence, and increased sexual desire with diminished potency. The partial inhibition of the higher critical and inhibiting centres may well be operative in both conditions.

The results of taking benzedrine provide an even closer parallel with hypomania. Peoples and Guttmann (1936) describe thus the psychic effects of benzedrine. There is increased talkativeness, depression and retardation vanish, the mood changes in the direction of euphoria, and there is motor restlessness. Personal experiences were described in glowing terms. One normal person felt extremely elated and free from all worries. Lectures seemed most lucid and interesting, and he felt an unusual self-confidence and equal to any task. Another felt an "exalted being." Guttmann and Sargant (1937), in 250 cases, confirmed the psychic changes. Objectively, they observed increased talkativeness and restlessness, while subjectively the subjects noticed increased confidence, initiative, and ease in making decisions. Thought was speeded up without impairing attention, concentration or judgment. Intelligence scores were increased by 8 per cent. (Sargant and Blackburn 1936). Sleeplessness was usual, but the lack of sleep was not unpleasant, and the subjects were often quite fresh in spite of it.

### MELANCHOLIA AND ANXIETY

The relation of melancholia or depression to mania and hypomania is well known. It occurs in the same type of person, has the same strongly hereditary factors (a 69 per cent. concordance in manic-depressive monozygotic twins and only a 16 per cent. concordance in dizygotic pairs), and the one may alternate with the other; but, since depression is far more common than mania, the true alternating manic-depressive psychosis is less usual than isolated or recurrent attacks of depression.

It is now customary to attempt to classify depression as exogenous or as endogenous, according to whether environmental or constitutional factors predominate. The situation here is greatly complicated by hysterical patients who have discovered that a complaint of "a feeling of depression" is more likely to be treated seriously than an anæsthetic limb or a well-staged fit. One has even seen an old lady who compromised with "a feeling of depression all down one side." Beyond their complaint, hysterical "depressions" show no other features of the real condition. At the same time, hysterical reactions are extremely common in depressed people; hence the finding of hysteria does not free one from seeking further for signs of true depression. Hysterical "depressions" are neither exogenous nor endogenous but another disease. Had the word "depression" not so thoroughly displaced "melancholia" in the vocabulary of the psychiatrists, the hysterics might never have learnt this new and confusing trick. The more one seeks to press the distinction between exogenous and endogenous depression, the more shadowy does the distinction become. In fact, it appears that there is a gradual transition between justifiable grief, anxiety state, exogenous depression, and endogenous depression. The position will become clearer if the main features of endogenous depression are summarised:—

(1) *The mood* is one of increasing listlessness, depression, and anxiety. Indifference to pleasant or unpleasant environmental changes is coupled with an egotistical personal worry. The present is regarded as gloomy and the future as hopeless. Indeed, hopelessness is one of the keynotes of the picture, and suicidal ideas naturally follow.

(2) *Thought and speech* are retarded. Output diminishes. Ambition vanishes. Concentration is poor and memory difficult. In the agitated depressive, however, gloomy thoughts may chase themselves round the mind very rapidly, though on neutral subjects retardation is seen.

(3) *Delusions.*—As an apparently secondary phenomenon, the patient seeks a cause, and delusions of hypochondriasis or of guilt develop. True external hallucinations are said not to occur in pure depression.

The diagnostic features are the mood, the hopelessness, the retardation, the secondary delusions, and the family and past history. The details of the form of the illness are varied. As Mapother and Lewis (1937) remark, there are many varieties of misery, and melancholia knows them all. It is by no means rare to find patients who show a fairly adequate external cause for their depression but only two of the diagnostic features—for example, depressed mood and retardation but no hopelessness and no delusions. I have already quoted a case showing a positive family and past history, with anxiety as the only other symptom. On what criteria, then, can we justifiably draw the lines between these four states? In justifiable grief one becomes indifferent to one's environment, poor in concentration, and even temporarily hopeless. In the anxiety states the revelation of unconscious causes all too often converts the condition into one of justifiable worry. This I tried to show in my paper on the suburban neurosis (Taylor 1938). In these states, too, constitutional factors may be present. Because a clear-cut trouble precipitates a severe depression, that depression cannot be regarded as exogenous. The occurrence of hypomanic and mildly depressive swings is well known in perfectly normal people, as is shown in the following quotation from an obituary notice by Wilson (1937):—

> "It was characteristic of Elliot Smith's methods of work to combine, or rather to alternate, periods of intense concentrated effort with intervals of apparent mental inertia. These were apt to be taken for mere idleness, but were actually, for him, indispensable and fertile brooding periods. And the succeeding phases of literary activity were at times astonishing, both in regard of rapidity of execution and of precision and finality of the product. Professor Wood Jones has commented on this the same diphasic characteristic of Elliot Smith's scientific activity."

It seems to me far more logical to think of the difference between the four states not as qualitative but as quantitative. As with mania, a rough assessment of the degree of depression present is of more use than any attempt at dogmatic artificial division.

*(To be concluded)*

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## PREVENTION OF MASTOIDITIS

### A SURVEY OF 621 CASES OF ACUTE OTITIS MEDIA TREATED WITH SULPHANILAMIDE

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LAST year we reported on a series of 155 patients with acute suppurative otitis media (A.S.O.M.), who had been treated with sulphanilamide as soon as they were admitted to the Royal Naval Hospital, Chatham (Horan and French 1938). We compared the incidence of acute mastoiditis in these cases with the figures for the Royal Naval Hospital for the previous three and a half years and showed that this had been reduced from 22·7 per cent. (1934–37, i) to 4·5 per cent. (1937, i–38, i). We put forward these figures not dogmatically but rather as an observation, with the hope that a further year would see them confirmed by ourselves and other workers. Private communications from other otologists in various parts of the country have confirmed our conclusions of last year, and in America Fisher (1939), in a controlled series of 185 cases, has obtained convincing results. One of us (V. G. H.) has, for the past eighteen months, been working at the naval boys' training establishment at Shotley (H.M.S. *Ganges*); hence we can now put forward a more convincing number of cases, as follows:—

| Period | A.S.O.M. | Acute mastoiditis |
|---|---|---|
| 1934–37, i | 607 | 138 (22·7 per cent.) |
| 1937, i–39, i (sulphanilamide used) | | |
| Chatham | 291 | 12 (4·1 per cent.) |
| Shotley | 330 | 9 (2·7 „ „ ) |
| Total | 621 | 21 (3·4 „ „ ) |

What is even more significant is that during the past two years there has not been one death from the complications of A.S.O.M., *because these complications have not arisen.* During the three and a half years before 1937 there were, on an average, 2·85 deaths a year

from this cause in the Naval Hospital. At Shotley no complications have been seen. At Chatham 2 patients were admitted with acute mastoiditis and lateral sinus thrombosis and were operated on at once; these have not been included in the series, though sulphanilamide was given after operation and both patients made an uneventful recovery. With the same incidence as that shown by hospital statistics before the introduction of sulphanilamide, these 621 cases would have produced about 140 cases of mastoiditis, with over 8 deaths, whereas there have been only 21 cases of mastoiditis and no deaths. If the difference in the time under treatment before return to duty between an uncomplicated case of A.S.O.M. and a case of mastoidectomy is at least five weeks, this represents a saving of some 4200 days' sickness (about eleven years).

### DETAILS OF TREATMENT

As before, all patients, as soon as seen, were given an emulsion of sulphanilamide (Colsulanyde, Crookes) by mouth in full doses according to age and weight, and continuing to a total dosage of not more than 40 g. Often the ear recovered before the maximal dosage had been reached. Prontosil Red, administered parenterally, was used where it was thought advisable to reach the maximal concentration in the minimal time. Neither of us performed myringotomy under twenty-four hours, except for pain and subsequently only when there was insufficient drainage of the middle ear. Predisposing factors, such as infected tonsils, adenoids, and sinusitis, were dealt with concurrently. The patients were placed on a normal diet; if there was nausea, the diet was reduced and sodium bicarbonate given, without any obvious amelioration of the nausea. The diet was not sulphur-free, but sulphur-containing drugs, such as magnesium sulphate, were avoided. When bacteriological examination of the ears revealed the presence of pneumococci and in cases in which the ear did not seem to be reacting well to colsulanyde M. & B. 693 was substituted.

Of the *Ganges* patients 229 were treated as outpatients, the remainder being placed sick. No untoward results were noticed from the ambulatory treatment. Since last year our knowledge of the dangers of administration of sulphanilamide to patients not under continual observation has been largely clarified, and, although from time to time there have been reports of the various toxic manifestations of the drug, we have not observed any except nausea, vomiting, and cyanosis. Nausea and vomiting are annoying but not alarming, and cyanosis is probably unimportant, except from an academic biochemical point of view (Fernet et al. 1939, Watson et al. 1939). It should be noted, however, that these ambulant cases, while outpatients, were under constant supervision. In view of the large amounts of sulphanilamide given daily all over the world, if the drug were as dangerous as the pessimists make out, more than the almost non-existent case-mortality directly attributable to the drug would certainly have been recorded.

In the above series white-cell counts were done regularly, and in 2 cases only the number of white cells dropped—to 5200 and 4800. In both of these cases sulphanilamide was stopped and Pentnucleotide given, after which the white-cell count returned quickly to within normal limits.

### OBSERVATIONS

The figures speak for themselves, and there is now no doubt that sulphanilamide has prophylactic qualities. The cases in which sulphanilamide did not prevent mastoiditis all showed the same characteristics; they were admitted with the typical history of coryza, followed by earache and otorrhœa, and differed clinically in no way from the cases which reacted well to sulphanilamide, except that the ear continued to discharge and the patient eventually developed symptoms of mastoiditis.

We agree with Maybaum and his colleagues (1939) that in some cases the administration of sulphanilamide appears to mask symptoms of an early mastoiditis. One case, for instance, showed only a "reservoir" sign and had a white-cell count of 24,000, with no other symptoms. At operation the mastoid cells were found to be hopelessly necrosed. On the other hand, the old classical acute mastoiditis, with displacement of the auricle, œdema over the mastoid process, acute tenderness, and cessation of the discharge, is, so far as we are concerned, now rare, and what is seen is the so-called "grumbling" mastoid, where the infection is almost subacute and the symptoms are not so obvious. Sulphanilamide even in these cases, appears to have prevented the development of anything resembling the fulminating mastoid, and it is because of this that we consider the *early* administration of sulphanilamide to be of paramount importance.

Increased confidence in the powers of sulphanilamide has led to a greater conservatism, so far as operation is concerned, than we dared to indulge in last year, when we stated that, although sulphanilamide would prevent mastoiditis, it would never cure it. This year we have seen several cases which, previously, would have been operated on, but which were treated conservatively for twenty-four hours and never came to operation. One such was as follows:—

A man, aged 33, admitted in the forenoon of August 8, 1938, with pain and discharge from his right ear. There was a previous history of periodic earache in this ear. The present attack started with coryza, followed by earache, deafness, and otorrhœa. Temperature 101·8° F., pulse-rate 70. Antero-inferior perforation of tympanic membrane, with pulsating discharge and an early sag of the postero-superior meatal wall. Tenderness over base of mastoid. White cells 9600.

Treatment: 10 c.cm. of a 2½ per cent. solution of prontosil red injected intramuscularly, followed by colsulanyde 2 drachms four-hourly. Guttæ hydrarg. nit. dil. to ear and foments. In the evening his temperature was 102° F. and white-cell count 13,400, but the ear was feeling easier. Next morning his temperature was 100° F. and white-cell count 8000, and there was no pain in the ear or on pressure over the mastoid, and the sag in the meatal wall was less. The ear was dry in eight days, and hearing was normal a week after this.

The foregoing clinical record is not meant to show that sulphanilamide is a cure for mastoiditis but to point out that, since the danger of complications arising from the expectant treatment of mastoiditis are so much less when sulphanilamide is being used, a more conservative attitude can be adopted, which will, in suitable cases of early mastoiditis, spare the patient an unpleasant operation and a long convalescence. Where the patient is admitted with hyperacute mastoiditis or with any complications arising therefrom, operation must be performed immediately; though, here again, sulphanilamide often produces miraculous results in an almost moribund patient.

Of the 5 cases which came to mastoidectomy at Chatham 3 were proved to be due to a hæmolytic streptococcus, and 2 were presumed to be pneumo-

coccal, though the organism could not be recovered from the mastoid antrum. The presumption of pneumococcal infection was made on the gross pathological appearance of the mastoid cells at operation. All 5 patients had had colsulanyde and M. & B. 693. All made an uneventful recovery and were discharged to duty with healed dry ears. It is presumed that these organisms were resistant strains.

It is difficult to judge whether the average number of days' sickness of an A.S.O.M. is shortened by the use of sulphanilamide, but we are of the opinion that it is. This view is confirmed by Fisher's (1939) cases. We have not found that the use of sulphanilamide in any way predisposes towards the encysting of infection and the consequent formation of a chronic otitis.

In this series 15 patients returned with a recurrence of the otorrhœa. Of these, 11 had tonsils which had been classed as "doubtful" when first seen and alone were sufficient to explain the recurrence; 4 other patients returned with an A.S.O.M. in the opposite ear. Now, if sulphanilamide predisposes to a recurrence, one would expect a nasopharyngeal infection to strike at the first ear affected, but these were normal when the patients were seen for the second time.

As before (Horan and French 1938) we have not found sulphanilamide to be of any value in the chronic suppurative ear. Here there are already macroscopical changes—perhaps ossicular caries—and the drug cannot be expected to influence these.

Most of our patients were aged 15–21.

## BACTERIOLOGY

Of the 136 patients with A.S.O.M. at Chatham last year 48 were swabbed, and of these 94 per cent. were reported as infected with hæmolytic streptococci. From the remaining 3 patients one culture of type III pneumococcus and two of "diphtheroids" were obtained. In our 1937–38 cases all those in which a swab was examined showed hæmolytic streptococci. The almost complete absence of pneumococci in this series of ear infections is remarkable because it has been found that in other places pneumococci are a common cause of otitis media. For example, Griffith (1938) reported that 42·4 per cent. of 137 cases of otitis media arising in public schools were caused by pneumococci.

It is possible that the lower incidence of mastoiditis during the last two years, as compared with the years 1934–37, was due not so much to the use of sulphanilamide as to a reduction in the virulence of the infecting streptococci. In the present instance, however, there is no evidence to support this theory. On the contrary, it appears that the clinical severity, besides the incidence, of streptococcal and other infections tends to increase with the rate of recruiting, which has so greatly increased recently with the expansion of the services. Therefore it seems improbable that the striking improvement which followed the introduction of sulphanilamide therapy can altogether be explained by a change in the character of the infecting organisms.

A large proportion of pneumococcal infection among patients with otitis media may in part explain why certain other workers may not have found sulphanilamide as effective as we have in the treatment of otitis media, because sulphanilamide would not be expected to have much effect on pneumococcal infections. Whether M. & B. 693 will have the same excellent results of both the pneumococcus and the streptococcus that colsulanyde has had in this series on the streptococcus is a matter which is under investigation and looks promising. In this respect one known pneumococcal case is worthy of record, in view of the relatively poor prognosis of this type of infection:—

A man, aged 57, was admitted with right earache and otorrhœa of three days' duration, following coryza. History of pneumococcal empyema thoracis some years previously. On admission, temperature 103·2° F., pulse-rate 90. Patient looked very ill, with blood-stained sero-purulent discharge from right ear, meatus being swollen and landmarks of drum obscured. No mastoid tenderness (often absent in these infections), white cells 15,300. Full doses of M. & B. 693 were given immediately (5 g. in the first twelve hours). The temperature began to drop next day, as did the white-cell count, and both were normal by the third evening after admission. The ear was dry five days after this, and the patient was discharged to sick leave after ten days.

One drawback to the widespread use of M. & B. 693 is the high proportion of gastric intolerance which follows its administration by mouth. One of us (S. G. F.) is at present investigating the use of nicotinic acid, administered with it, to reduce these symptoms, as suggested by McGinty and others (1939). The soluble sodium salt, administered parenterally, is also an improvement in this way and raises the concentration quickly. Certainly, if these difficulties can be overcome, the worries of the otologist will be materially lessened in the future.

## CONCLUSIONS

All cases of A.S.O.M. should have sulphanilamide administered as early as possible, besides the accepted treatment of the acute ear. White-cell counts are of great value, both as a check on the administration of the drug and as an index of the progress of the disease. The infecting organism should be identified if possible and M. & B. 693 substituted for sulphanilamide where a pneumococcus is found.

## SUMMARY

A series of 621 cases of acute suppurative otitis media treated with sulphanilamide in the last two years is reviewed. The incidence of mastoiditis was only 3·4 per cent., compared with 22·7 per cent. before the introduction of treatment with sulphanilamide.

In all cases a course of colsulanyde by mouth was begun as soon as the patient was seen, the total dosage not exceeding 40 g. Prontosil red was given by injection in some more acute cases. If pneumococci were isolated, M. & B. 693 was substituted for sulphanilamide. Many of the patients were treated as outpatients under constant supervision. No serious toxic manifestations were seen.

It is urged that all cases of acute suppurative otitis media should receive sulphanilamide or sulphapyridine. This will greatly reduce the incidence of mastoiditis and will allow a more conservative attitude to be adopted once mastoiditis develops.

We wish to thank Surgeon Rear-Admiral S. F. Dudley for his assistance in compiling these results; Dr. Robert Forgan for his advice concerning dosage and toxicity of M. & B. 693; and Messrs. May and Baker Ltd. for samples of the sodium salt of M. & B. 693.

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# THE THERAPEUTIC POOL

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The after effects of war injuries in rheumatic subjects are apt to be complicated by a greatly protracted convalescence associated with much more pain and muscular stiffness than would be expected in ordinary people. The term "war injuries" is used here in its widest sense and includes not only gunshot wounds but also every kind of trauma besides exposure to cold, damp, and other adverse conditions, physical and mental. The susceptibility to manifestations of chronic rheumatism, such as pain and limitation of movement, implies a deficiency in the adaptive functions of the human organism. Patients in whom these adaptive functions are lacking or subnormal are seriously handicapped in their struggle against such adverse influences as chills, climatic vagaries, occupational stresses, bacterial invasions, and unsuitable food. Under ordinary conditions the body can adapt itself to constant changes in temperature and humidity. People vary enormously in their liability to "take cold;" some can sit for hours in damp clothing without ill effect, whereas others exposed to similar conditions contract a severe brachial neuralgia or lumbago. It is thought by many observers that one of the essential causes of the rheumatic syndrome is an inefficient cutaneous circulation. Most clinicians will agree that a rheumatic limb is colder than normal and shows evidence of peripheral vasoconstriction.

In considering the provision which will undoubtedly have to be made for dealing with this class of war disability it is to be sincerely hoped that the claims of the therapeutic pool will not be overlooked. Anyone who has had practical experience of the pool in the treatment of the various manifestations of chronic rheumatism cannot but be impressed with its value. Since it is equally applicable in non-rheumatic cases, there is every reason to assume that the results will be even better in the treatment of pain, stiffness, and deformity following war injuries affecting the limbs of possibly younger or, at any rate, healthier people. For some unexplained cause the therapeutic pool, apart from the spas, has never attained the popularity in this country that it has in America. A few institutions have installed them, and the sole object of this paper is to urge the importance of a rapid increase in their number. That this form of treatment is more extensively used in the United States is clearly shown by the responses to a questionnaire, addressed by Lowman[1] to a hundred prominent institutions, which indicate that two-thirds of these have had therapeutic pools for two months to eleven years, with an average of five years.

## MECHANICAL EFFECTS

A reference to any textbook on physics or hydraulics will recall the following facts: (1) a floating body displaces its own weight of liquid; (2) a body wholly or partially immersed in a fluid is buoyed up by a force equal to the weight of fluid displaced; (3) hydrostatic pressure increases in direct proportion to fluid density and vertical depth of pressure point below the surface level; and (4) pressure on the surface of a moving body is directly related to the velocity of motion. Based on these principles, some important observations regarding movements in water have been made.

*Movement of the limbs against viscosity.*—The internal resistance of a fluid is called its viscosity. When a body sinks to a point where it lies as a dead weight, it is buoyed up by a pressure exerted by the water, which is equal to its weight. The body, being supported at all points by this force, is in much the same position as if it rested upon a table. If it is desired to move the body sideways, the upward pressure being constant, all that must be overcome is the dynamic pressure caused by the relative viscosity of body and water and the frictional resistance of the surface of the body. In other words, movement in water is merely the overcoming of the internal friction of the joints besides the resistance of the lateral pressure. Muscles sufficiently healthy to contract definitely but unable to move a joint out of water can often function in water. A good example of this is often seen in the stiffened and painful hip-joints in cases of coxarthritis: patients who have to be wheeled or carried and lowered into the pool can at once walk in the water with apparent ease.

*Movement against gravity and weight of superincumbent water.*—The contraction of a muscle raising a limb in water to a higher level towards the surface is aided by buoyancy. The work is done by the muscles pulling from the insertion towards the origin. The intrinsic muscles move the limb upwards and involve the extrinsic stabilisers of the joint according to the effort needed. Since the pull of gravity in water is nearly negligible, very little work is required of the intrinsic muscles.

*Resistive action in pulling a part downwards from the surface.*—This movement (the opposite to the one described above), being against the upward water pressure, needs more force in both intrinsic and extrinsic groups of muscles. If, for example, the patient is floating supine and performs a submergence movement of a leg by forcing it downwards in extension, the gluteal muscles intrinsically carry it out, while the back extensors and the abdominals are actively concerned in securing pelvic stabilisation extrinsically. This extrinsic fixation really consists in the effort of muscles to steady a base of action. Lowman summarises the differences between the work of a regulation remedial gymnasium and that carried out in the therapeutic pool as follows:—

(1) There may be no fixed resting-place in water, whereas there is in the gymnasium. In the water muscles contract and move origin and insertion or both, whereas the fixation in the gymnasium work does not allow this freedom of action.

(2) In the water a flow of fixative effort goes completely round the body, as though it were a cylinder. More synergists may be called into play because of the difficulty in obtaining stability. In consequence an unbalanced strong muscle assumes disproportionate activity—hence greater importance.

Lowman also points out that, even though a muscle has received special intrinsic training for several years and has apparently reached its maximal recovery in the gymnasium, it may improve still further in underwater work, owing to the tension load being increased by voluntary work as an extrinsic stabiliser before continuing its intrinsic action. In under-water work the necessity of developing these extrinsic stabilisers of origin or base of action of intrinsic groups opens up new possibilities of many muscles.

## EXPENDITURE OF ENERGY

The relative expenditure of energy in exercises performed in air and water has been investigated by

1. Lowman, C. L. The Technique of Underwater Gymnastics, Los Angeles, 1937.

Crowden.[2] As a result of experiments carried out at the British Red Cross Society's rheumatism clinic it was found, by estimating the relative increase in the oxygen requirement over the resting level in air and water, that the increased oxygen requirement per minute of exercise was about twice as great in air as in water. The subject of the experiments plainly showed that he was practically exhausted after a period of two minutes' exercise in air, but under water he would carry on with the exercise almost indefinitely at the same rate. It is a matter of common knowledge that it would be impossible to perform in the air the ordinary motions of swimming for more than a few minutes, whereas under water they can be carried out for long periods.

### THERMAL EFFECTS

Of the various means of applying heat to the surface of the body water is probably the best. This is no doubt due to its high specific heat, by which is meant the quantity of heat absorbed or evolved when a unit mass of a substance undergoes an increase of temperature of 1° C. For example, it takes much longer to heat a pint of water up to, say, 110° F. than an equal weight of iron, but the water in cooling will give out much more heat. Water has therefore a higher specific heat than iron.

### EFFECT ON PERIPHERAL CIRCULATION

The blood-vessels of the skin—arterioles, capillaries, and venules—form one of the blood depôts of the human body. According to McDowell, about 10 per cent. of the total blood volume is stored in the skin, the other depôts being the spleen, liver, splanchnic area, lungs, larger veins, and bone-marrow. The cutaneous vessels are controlled by the sympathetic nerves, mostly vasoconstrictor, which are especially abundant in the skin. The skin vessels are readily influenced by changes in the tonic activity of the vasomotor centre and respond quickly to local, thermal, mechanical, and chemical stimuli. Besides this centrally produced vasoconstriction, the capillaries respond to mechanical stimulation, which liberates histamine from a precursor normally present in the skin. This sets up local vasoconstriction, then vasodilatation, and increased permeability of the vessels, which are included in the "triple response" so graphically described by Lewis. The surface application of heat causes the blood to flow in much larger volume through the dilated peripheral vessels, and the skin becomes reddened in consequence. Besides the dilatation of the arterioles, the number of open capillaries is increased, as is the rate of blood-flow through them. At a temperature of 90°–100° F. the rate of exchange between the blood and tissues reaches its optimum. In these circumstances the blood entering the veins contains 60–65 per cent. of its saturation value of oxygen. Too great heat (105° F. and above), while further increasing the number of open capillaries, accelerates the flow of blood to such an extent that the blood entering the veins simulates arterial blood, containing about 91 per cent. of its saturated value of oxygen. It should hardly be necessary to emphasise the supreme importance of improving the blood-supply and thereby promoting increased tissue exchanges in limbs in which, as a result of wounds, the circulation has been interfered with and their mobility diminished by the presence of exudations caused by inflammation.

### UNDER-WATER DOUCHE

The under-water douche or *douche sous-marine* consists of a stream of water under pressure, at a temperature 10° higher than the pool, delivered through a hose with a fairly wide nozzle. This, directed against the submerged portions of the body, has a pronounced analgesic effect in painful conditions of various kinds. It constitutes, moreover, a most effective form of under-water massage, for the skin can be seen to be depressed by the force of the current as the nozzle is moved along its surface.

2. Crowden, G. P. *J. Physiol.* 1935, **84**, 31.

### CONSTRUCTION OF POOL

*Size.*—Lowman recommends a pool 12–15 ft. wide and 20–24 ft. long for a large institution, if the pool is to be used for all types of cases in a full range of treatments. A depth of 4 ft. 6 in. at the deep end, graduated to 2 ft. 6 in. at the shallow, will be found to provide the least possible amount of water needed for constant practical use. In hospitals where adults predominate a greater depth, up to 5 ft., is of advantage. A pool less than 12 ft. wide is too small for certain exercises. For instance, from a plinth placed close to the side wall a 6 ft. patient with arms extended overhead will project 7–8 ft. Certain exercises that require the technician to stand beyond the patient's feet, reaching forwards to grasp the ankles, will need at least 2 ft. more, making necessary a minimum of at least 10 ft.

With a plinth placed at the narrow end of a pool and projecting lengthwise, the arm and leg spread in wide double abduction require at least 6 ft. Therefore 10 × 12 sq. ft. is the least amount of space useful for treatment, except in pools used exclusively for small children or for simple movements for localised muscle training for paralysis or fractures. Short pools cannot be deep enough to accommodate both shallow-water and deep-water exercises without having too steep a slant to the floor; this steepness interferes with the stance of the technician, the walking exercises of the patient, and the placing of any pedestal-supported apparatus.

These particulars regarding the dimensions of therapeutic pools in America, taken from Lowman's book, show that such pools are more applicable to institutions where every variety of remedial exercise is in use for the treatment of such neurological conditions as poliomyelitis and spastic paralysis. For rehabilitation after war wounds the installation need not be so elaborate.

*The therapeutic pool at the B.R.C.S. clinic* is circular, measures 18 ft. across, and allows for a depth of water of 3 ft. 4 in. It is kept at a temperature of 100° F. by the constant addition of hot water; hence it is really a flowing pool. When several patients are in the pool at one time, the under-water douche helps to maintain the required temperature. Fixed to the floor is a set of parallel bars, on which the patients carry out various gymnastic movements. It is not usually necessary to have a technician in the water; since in most cases active not passive movements are needed, the necessary instructions can be given from outside the pool. Seats are fixed within the circumference of the pool, so that patients can carry out entirely under water all movements involving the shoulder girdle. Steps with a handrail are provided for entering the water.

### TREATMENT OF WAR DISABILITIES

The news-letter circulated in January, 1940, by the Central Council for the Care of Cripples says:—

"... But when we come to the question of restoration of function, something more is required than is generally found in the massage and physiotherapy departments of a hospital. Massage, movements, electrical treatment serve their purpose up to a point,

but actual use of the damaged limb, if possible under conditions which distract the attention from the disability, have a greater value. For this reason, facilities for exercise in a gymnasium for indoor and outdoor games and for light work are required ; and an instructor with the necessary persuasive power should be available to help the patients to resume their activities and to get back their confidence."

It would not be easy to find a more cogent argument for more pools in this country than that supplied by this paragraph. The therapeutic pool does supply something more than massage, movements, and electrical treatments, after these have served their purpose, because a patient, when he finds that movements which were difficult or impossible become comparatively easy under water, is encouraged and strengthened in his determination to persevere in his efforts. It appears therefore that the therapeutic pool occupies a position midway between ordinary massage and electrotherapy and occupational therapy. One has but to see a therapeutic pool in use and talk to the patients undergoing treatment to be convinced of its efficacy.

## EFFECTS OF SOME PRESERVATIVES ON STORED BLOOD

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ALTHOUGH many investigations have been made on the preservation of blood, comparatively few have included studies of the chemical changes. Blood is a highly complex physicochemical system, and changes may arise through alterations in the organic constituents, by diffusion across the membrane of the red cell, or by liberation of the cell contents after rupture of the membrane. The experiments described below form part of some investigations designed to obtain more detailed knowledge of the chemical changes in blood during storage, and we propose in this paper to limit our discussion to hæmoglobin and potassium and phosphorus compounds, because these constituents are present in widely different concentrations in the cells and plasma of normal blood. In these experiments only the anticoagulant and the atmosphere above the blood were varied, while other factors, such as temperature, degree of dilution, area of contact between cells and plasma, and degree of mechanical disturbance, were kept constant. Alterations in any of these conditions might be expected to influence the chemical changes in blood by promoting or by retarding chemical reactions or by altering the permeability of the cell membrane.

### EXPERIMENTS

An anticoagulant solution was put into each of twelve sterilised quart-sized milk bottles (lettered A to M) as follows :

Bottles A, B, C, and D each received 25 c.cm. of a solution containing 2·18 g. of anhydrous sodium citrate. Bottles E, F, G, and H each received 9 c.cm. of a solution containing 45 mg. of heparin equivalent to 18,000 units (Roche). Bottles J, K, L, and M each received 25 c.cm. of a solution containing 2·18 g. of anhydrous sodium citrate and 6·25 g. of glucose.

Fresh sterile blood (600 c.cm.) was collected from each of twelve donors belonging to group B, added to the prepared bottles, and well mixed with the anticoagulant solutions. The final concentrations of the anticoagulants in the three series of bottles were thus 0·35 per cent. of sodium citrate, 7·5 mg. of heparin per 100 c.cm., and 0·35 per cent. of sodium citrate + 1 per cent. of glucose respectively. Aliquots of 60 c.cm. were transferred under sterile conditions from each of these bottles (A–M) to a series of 120 sterile bottles lettered $A_0$, $A_1$–$A_9$ ; $B_0$, $B_1$–$B_9$ ; . . . . $M_0$, $M_1$–$M_9$ (180 c.cm. capacity ; 9 cm. high × 4·2 cm. diameter, making a depth of liquid of 4·5 cm.). The atmospheres (over the blood) in these bottles were adjusted so that the following combinations were obtained :—

| | Citrate | Heparin | Citrate-glucose |
|---|---|---|---|
| Air | $A_0$–$A_9$ | $E_0$–$E_9$ | $J_0$–$J_9$ |
| Oxygen | $B_0$–$B_9$ | $F_0$–$F_9$ | $K_0$–$K_9$ |
| Reduced pressure | $C_0$–$C_9$ | $G_0$–$G_9$ | $L_0$–$L_9$ |
| Carbon dioxide | $D_0$–$D_9$ | $H_0$–$H_9$ | $M_0$–$M_9$ |

These bottles were sealed with sterile screw caps, coated with paraffin wax, and placed in the refrigerator at 4° C. The first bottle of each of the twelve series ($A_0$–$M_0$) was used for analysis at the beginning of the experiment, and twelve further bottles, one from each of the series A–M, were removed together at intervals over a period of thirty days. The physical appearance of the blood in each bottle, after it had been removed from the refrigerator, was carefully noted. The blood was then shaken to ensure a uniform distribution of cells ; samples were removed for bacteriological and cytological examination by Dr. J. Goldman (whom we thank for his assistance in the collection of the blood from the donors), and the remainder was then used for the following analyses :—

Plasma : (1) inorganic, total acid-soluble and lipoid phosphorus (Fiske and Subbarow 1925) ; (2) potassium (Jacobs and Hoffman 1931) ; (3) hæmoglobin as iron (modification of Blackwood and Stirling 1932 and Jackson et al. 1935).

Whole blood : (4) cell volume by the hæmatocrit (Wintrobe tube) ; (5) inorganic, total acid-soluble and lipoid phosphorus ; (6) potassium and iron on the initial samples.

In the preparation of the plasma the blood was centrifuged under a layer of oil, and the separated plasma was recentrifuged to remove completely all the cells. From a review of some 2000 of our analyses it was obvious that the effects of storing the blood under different atmospheres or reduced pressure were small in comparison with those produced by using anticoagulants such as citrate or heparin. In the present paper, therefore, we shall limit our discussion to the influence of the latter. Our results are summarised in the accompanying table and fig. 1.

### DISCUSSION

*Degree of hæmolysis.*—One important fact observed was that the appearance of the supernatant plasma in the bottles immediately after removal from the refrigerator was of little use in assessing the degree of hæmolysis. Even after three or four weeks' storage the supernatant plasma was often clear, although after mixing and centrifuging hæmolysis was obvious in the separated plasma. In some cases a layer of hæmolysis was apparent below the undisturbed supernatant

CHANGES IN PLASMA, HÆMOGLOBIN, POTASSIUM, AND INORGANIC PHOSPHATE

| Day | Citrate (Mean values of series A, B, C, D) | | | | Heparin (Mean values of series E, F, G, H) | | | | Citrate-glucose (Mean values of series J, K, L, M) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Observed hæmolysis | Hb.* | K † | Inorg. P † | Observed hæmolysis | Hb.* | K † | Inorg. P † | Observed hæmolysis | Hb.* | K † | Inorg. P † |
| 0 | — | — | 21·2 | 3·00 | — | — | 21·7 | 3·83 | — | — | 21·9 | 3·37 |
| 1 | — | — | 27·9 | 2·64 | — | — | 33·7 | 3·09 | — | — | 38·7 | 2·30 |
| 2 | — | 0·12 | 39·9 | 3·09 | — | 0·46 | 48·7 | 3·19 | — | — | 53·6 | 1·78 |
| 3 | + | 0·21 | 58·2 | 3·04 | + | 1·8 | 65·0 | 3·75 | — | — | 62·1 | 2·23 |
| 5 | + | 0·30 | 88·0 | 3·29 | + + | 2·2 | 79·7 | 4·43 | — | — | 77·9 | 2·86 |
| 9 | + + | 0·75 | 92·4 | 3·65 | + + | 3·2 | — | 6·92 | — | 0·11 | 97·6 | 3·41 |
| 16 | + + | 1·80 | 129·0 | 5·95 | + + + | — | 131·0 | 8·86 | — | 0·21 | 115·0 | 4·96 |
| 23 | + + | 2·80 | 154·0 | 8·62 | + + + | 4·2 | 159·0 | 10·94 | — | 0·35 | 129·0 | 6·88 |
| 30 | + + | 4·30 | 170·0 | 9·46 | — | — | — | — | + | 0·87 | 145·0 | 10·10 |

* g. per 100 c.cm. † mg. per 100 c.cm.

plasma and above the cells, and one effect of mixing was to distribute this throughout the blood. It is probable that the shaking caused also the further breakdown of the more fragile cells. For both these reasons, therefore, the figures obtained by the present technique must be higher than those obtained for the undisturbed supernatant plasma ; since shaking is an essential preliminary to the use of the blood for transfusion, it is felt that our data give a truer picture of the fluid that would be transfused.

The "observed hæmolysis" given in the table therefore refers to the appearance of the plasma after

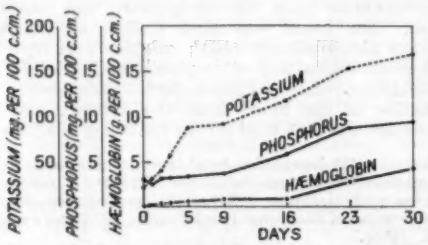


FIG. 1—Changes in concentration of plasma hæmoglobin, potassium, and inorganic phosphorus in citrated blood.

mixing and centrifugalisation and not to the supernatant plasma which had separated out during storage. A slight degree of hæmolysis was obvious in the citrate and heparin series on the third day, and this increased throughout the course of the experiments, being more pronounced in the heparinised blood. In the blood mixed with citrate + glucose the plasma was clear until the final sample on the thirtieth day. These observations were confirmed by determination of the plasma hæmoglobin (calculated from the plasma iron). The figures show that a measurable amount of free hæmoglobin was present in the plasma on the second day in the heparinised and citrated series. On the twenty-third day the amounts in the heparin, citrate, and citrate-glucose series were 4·2 g., 2·8 g., and 0·35 g. per 100 c.cm. respectively, corresponding to a hæmolysis of 15 per cent. (heparin series), 10 per cent. (citrate series), and 1·2 per cent. (citrate-glucose series). On the thirtieth day the hæmolysis had increased to 15·3 per cent. for the citrate series and 3 per cent. for the citrate-glucose series. It will be noted that the blood preserved in citrate-glucose was less hæmolysed on the twenty-third day than the heparinised series on the second day and the citrated series on the ninth day.

A matter of the greatest importance in transfusions is increased viscosity and formation of clots in the stored blood. We observed that the blood preserved with heparin became extremely viscous, clots appearing on the third day and increasing throughout storage. On the other hand, no clots were formed in the citrated blood, although there was some slight increase in viscosity. The blood, however, was only slightly diluted by the addition of the anticoagulants. Dilution—e.g., with isotinic saline—is often recommended for the storage of blood, and it is possible that a further dilution of the heparinised blood might retard more effectively the formation of clots and the onset of hæmolysis.

*Changes in plasma potassium.*—The table and fig. 1 show that a rise in plasma potassium took place during the first few days of storage and continued, though not so sharply, throughout the period investigated. None of the preservatives employed prevented the release of potassium from the cells into the plasma, although in the later stages the potassium levels in the citrate-glucose samples were lower than in the others. The increase in the plasma potassium in the later stages is due partly to the liberation of the cellular potassium by hæmolysis, but the initial rapid increase in plasma potassium cannot be due to this, as is shown by a comparison with the hæmoglobin figures (fig. 1). It therefore appears very probable that the cell membrane, which in vivo is usually considered to be impermeable to potassium ions, allows such ions to pass through soon after removal from the human body. These observations are in agreement with the studies of Ponder and Robinson (1934), Kerr (1929), Davson (1934), and Maizels (1935) on permeability and with the extensive investigations of Scudder et al. (1939).

The conditions governing the permeability of the cell membrane to potassium and other ions are very complex. It is obvious, however, that the osmotic pressure of the preserving fluid is a matter of prime importance and one to which insufficient attention has been paid in studies on blood storage, as Maizels and Whittaker (1939) have well demonstrated.

*Distribution of phosphorus compounds.*—The changes which took place in the distribution of the phosphorus of the cells and plasma of series A (citrate-air) are shown in fig. 2. Similar curves were obtained in all the other series. The main changes were as follows.

(1) Lipoid phosphorus remained constant in the red cells and plasma within the limits of experimental error.

(2) Organic acid-soluble phosphorus, after a small but consistent initial rise, sharply decreased in the red cells. In the plasma, after a slight initial rise, the value returned to its initial low value and remained constant.

(3) Inorganic phosphorus, after a small initial decrease, sharply rose in the red cells. A similar sequence of changes took place in the plasma, but the increase was delayed and not so pronounced.

(4) Total acid-soluble phosphorus: the changes were a summation of (2) and (3). The value was constant for whole blood but decreased in the red cells and increased in the plasma.

It is probable that these changes are the result of three main processes: the enzymic degradation of organic phosphates in the cells; the slow diffusion of the liberated inorganic phosphate into the plasma; and (in the later stages) the addition to the plasma of the phosphates of the hæmolysed cells. These processes take place at different rates; for example, on the ninth day the concentrations of organic and inorganic phosphate in the cells (sample A) were 16·9 mg. per 100 c.cm. and 22·1 mg. per 100 c.cm. respectively, representing a degradation of over half of the cellular organic phosphate and a sixfold increase in inorganic phosphate. Thus, in spite of the low temperature this process is fairly rapid. On the other hand, diffusion, depending on an increase in the permeability of the cell membrane for phosphate ion, has led on the ninth day to only a slight increase of the plasma inorganic phosphate. In the example quoted there was a 10 per cent. increase, some of which was due to hæmolysis, which in the later stages will play a major rôle (see fig. 1).

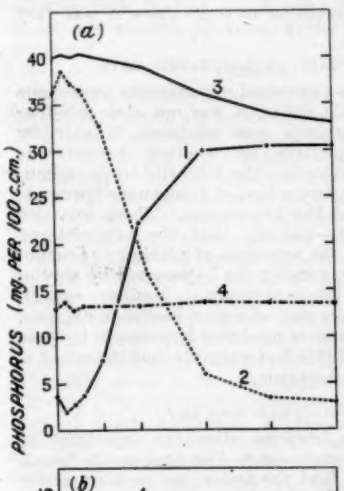


FIG. 2—Changes in distribution of phosphorus in citrated blood: (*a*) cells; (*b*) plasma; 1, inorganic phosphorus 2, organic acid-soluble phosphorus; 3, total acid-soluble phosphorus; 4 lipoid phosphorus.

The impermeability of the erythrocyte to phosphate ion at low temperatures has been emphasised by Maizels and Whittaker (1940), who have further shown that incubation for a few hours has a more profound effect than storage at 4° C. for many days. Higher temperatures would be expected to accelerate all the above processes, and further experimental evidence for this has been provided by the experiments of Martland et al. (1924) and Bick (1939).

The relative constancy of the lipoid phosphorus in both cells and plasma is of importance in that it shows that little if any of the inorganic phosphate can be derived from this source. With extensive hæmolysis an increase in plasma lipoid phosphorus would be expected. The initial fall in plasma inorganic phosphate is to be ascribed to a temporary enzymic synthesis of organic phosphate by a combination of the inorganic phosphate with the glucose of the blood (Lawaczeck 1924, Martland et al. 1924). This explanation is supported by the fact that the effect was much more pronounced in the series preserved with citrate-glucose.

These observations may provide a clue to the beneficial effect of glucose preservation, a fact observed by many workers (Rous and Turner 1916, Gwynn and Alsevers 1939, Harington and Miles 1939, Bick 1939, Maizels and Whittaker 1939, 1940). The last-named authors have put forward three possible explanations: the osmotic pressure effect due to the low permeability of the cell membrane to glucose; the physicochemical effect on the cell membrane; and the maintenance of cellular metabolism. It seems probable that all these processes are involved, but our data appear to indicate that the maintenance of cell metabolism may be of considerable importance, and that the most important effect of the added glucose may be to retard the degradation of the organic phosphates. These compounds probably play an important part in cellular metabolism besides assisting in the maintenance of osmotic and acid-base equilibrium (Peters and Van Slyke).

## CONCLUSIONS

(1) In the plasma of stored blood there is an immediate rise in potassium, an initial fall followed by a gradual rise in inorganic phosphate, and a delayed and gradual rise in hæmoglobin.

(2) Since there is no direct correlation between these changes, different processes must be involved.

(3) In blood stored with the minimum of dilution, citrate-glucose appears to be definitely better than citrate alone, and both are better than heparin as anticoagulants in delaying hæmolysis and in retarding the chemical changes in the cells leading to increased values for plasma inorganic phosphate.

(4) None of these anticoagulants prevented the diffusion of potassium into the plasma, but over a long period the citrate-glucose showed a lower value for plasma potassium, probably owing to the lower degree of hæmolysis.

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# HYPERÆMIA AS A TEST OF MALE SEX HORMONE

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SEX hormones, both in the natural state and when synthesised, cause hyperæmia (Steinach 1910 and 1936, Steinach, Peczenik, and Kun 1938). The development and maturity of seminal vesicles, prostate, uterus, and mammary glands are accompanied by a considerable hyperæmia, which can also be produced by administering the corresponding synthetic hormones (Steinach, Dohrn, et al. 1928). Hyperæmia was also produced in males by ligature of the vasa deferentia. This hyperæmia also affects the entire organism, as shown by considerable hyperæmia of abdominal muscles, mesentery, intestine, skin, and brain (vital stain) in senile rats after ligature of the vasa deferentia. Identically similar results were obtained by administering hormones. The clinical study of the influence of sex hormones on high blood-pressure and hypertonia also demonstrates that the administration of male hormones and of male and female hormones together both reduce hypertonus and increase the circulation (Steinach, Peczenik, and Kun 1938).

The following description of hyperæmia, produced by the male sex hormone (testosterone) in the skin of the male genital region, confirms our earlier findings in experiments with gonadotrophic hormone administered to infantile male rats (Steinach and Kun 1928). At that time we found that gonadotrophic hormone induced precocious sexual maturity as regards seminal vesicles, prostate, penis, libido, and potency, by activating the secretion of the testes. The first sign of precocious maturity was hyperæmia of the perineal and scrotal regions. At the same time, the testicles descended, as a result of which the skin of the scrotum became tense and the hyperæmia more striking. This sign can only be observed in albino or spotted males with little pigment in the perineal region.

The synthesis of various substances with androgenic activity has raised the question as to which of these substances, if any, is the natural hormone. To settle this question it is necessary to compare the effects of every synthetic hormone with those of the biologically prepared hormone. Since we attributed the above-mentioned appearance of scrotal hyperæmia and descent of the testes to the influence of increased physiological testicular hormone, we proceeded to find out whether synthetically prepared compounds could produce qualitatively and quantitatively identical responses.

## EXPERIMENTS ON NORMAL RATS

Our experimental animals were normal infantile male rats. The animals were seventeen to fifty-six days old (body-weight 15–47 g.) at the beginning of the injections. We investigated one substance of the androsterone group (androsterone benzoate) and one of the testosterone group (testosterone propionate). A few animals were also treated with œstradiol benzoate and progesterone. In every experiment litter mates were used as controls. The total amount of the hormone was divided into ten equal single doses (testosterone propionate dissolved in 0·05–0·2 c.cm. of sesame oil, and androsterone benzoate in 0·1 and 0·5 c.cm). and injected within five days (once in the forenoon and once in the afternoon). The controls regularly received equal quantities of pure sesame oil.

Testosterone propionate was injected in doses of 0·1–50 mg. into 80 animals, and sterile oil into 60 controls, the animals coming from forty-eight litters. Androsterone benzoate was administered in doses of 20 and 100 mg. These high doses were chosen because of the slight effect of androsterone on the seminal vesicles and prostate of mammals. The results with androsterone benzoate were so clear that we contented ourselves with only 8 experimental animals and 10 controls from five litters.

## RESULTS

The males treated with testosterone propionate showed all the symptoms we had observed as a result of injecting gonadotrophic hormone. Hyperæmia of the perineal region developed on the fourth to sixth day of treatment according to the dose. It began at the caudal end close to the anus and then extended towards the penis. The culminating point was reached on the sixth or seventh day. Then in the following two or three days the redness rapidly disappeared. The hyperæmia of the scrotum was accompanied by a remarkable reduction in the density of the hair at that place. This is also a sign of maturation, for the scrotum of the adult animal is only scantily covered with hair. Removal of the perineal skin showed that parts of the perineal muscles were also hyperæmic. During narcosis or after death the hyperæmia of the scrotum and perineum disappeared immediately; hence increase in the circulation cannot be proved microscopically. The smallest dose with which a recognisable redness could be demonstrated was 0·25 mg. If 0·1 mg. was injected, there was usually no hyperæmia or in some cases it was very slight.

## EXPERIMENTS ON CASTRATED RATS

Since the above-mentioned experiments were made on normal infantile males, it was not clear whether the scrotal hyperæmia was produced directly by testosterone propionate or whether testosterone propionate, by activating the infantile testis, stimulated an increased production of autogenous hormone, which then caused the hyperæmia. There was also a third possibility—namely, that the administered hormone induced the secretion of pituitary (gonadotrophic) hormones, causing the hyperæmia by way of hypophysis → testicle → scrotum. Similar experiments were therefore carried out on castrated animals. Testosterone propionate produced hyperæmia in these castrated rats, and this fact suggests that the effect is directly due to this hormone.

## TESTICULAR DESCENT

Descent of the testicles after the injections of testosterone propionate can be observed on the fourth to sixth day. At first the testes can be more easily pressed digitally from the abdomen into the scrotum, but they slip back again after removal of the pressure. When the animals are killed on the sixth or seventh day after the beginning of the treatment, the testicles are regularly found in the scrotum, in contrast to the controls, in which they remain in the abdomen. The threshold value for this response is 0·25 mg. of testosterone propionate. These experimental results suggest that testosterone propionate may be of value in the treatment of cryptorchism in human males. Androsterone benzoate (20 and 100 mg.) did not induce hyperæmia or descent of the testes in any animal. A negative result was also obtained

with œstradiol benzoate (60 and 500 g.) and progesterone (5 and 50 mg.)

### COMMENTS

It thus seems that testosterone propionate alone of the male and female hormones used is capable of producing effects which were obtained with biological extracts of male hormone. Whether or not scrotal hyperæmia and descent of the testes are strictly specific effects of testosterone will be tested by examination of other male-hormone derivatives; if they are, a specific test for testosterone has been found for the first time, for the usual methods of standardisation on the comb of capons and on the seminal vesicles of rats do not allow a differentiation between androsterone and testosterone, even though there are considerable quantitative differences in the efficacy of the two hormones.

The negative results with œstradiol benzoate are of particular interest, for they appear to contradict our earlier experiments which showed that the female hormone produced a definite hyperæmia of brain, eye, and skin (Steinach, Kun, and Peczenik 1936, Kun 1937). It must be realised, however, that in these earlier experiments senile animals with underfunctioning organs were used. Œstradiol benzoate did not cause hyperæmia in the strict sense of the term in these animals but restored to normal the defective or disturbed functions of blood-vessels or, as Steinach called it, stimulated a "euhæmy" (Steinach, Peczenik, and Kun 1938). Œstradiol benzoate is incapable of raising the circulation beyond the normal limit in young animals, as has been shown by experiments on the brain and skin. But the female hormone also produces true hyperæmia of the uterus, mammary gland, and areola (Steinach, Dohrn, et al. 1928) comparable with that of the seminal vesicles, prostate, penis, and scrotum produced in the male by the male hormone.

### SUMMARY

Testosterone propionate induces hyperæmia of the scrotal region and a precocious descent of the testicles in infantile male rats. The threshold value of both effects is 0·25 mg. Hyperæmia can also be obtained in castrated animals, a fact which indicates a direct effect of testosterone propionate on the cutaneous circulation. Androsterone benzoate, œstradiol benzoate, and progesterone do not produce this effect. The examination of further male-hormone compounds will show whether this action of testosterone is specific or not. If it is specific, the scrotal hyperæmia could be used as a test to identify testosterone.

Of all the synthetic hormones tried in these experiments testosterone alone acts like the natural hormone. This fact seems to be important for future hormone therapy; for the aim of clinical treatment must be the use of those hormonal substances whose effects resemble most closely those of the natural sex hormone. An advance towards this goal can be seen in the combined administration of male and female hormones proposed by us for the treatment of hypertonia and high blood-pressure (Steinach, Peczenik, and Kun 1938).

We are indebted to Prof. W. Schoeller, of Messrs. Schering, Berlin, for supplies of the hormones.

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## ACUTE SUBDURAL HÆMATOMA

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I am prompted to report the following case after reading that described by Templeton in The Lancet of March 16, for although chronic subdural hæmatoma has been recognised for many years as a clinical entity the acute variety is not so well recognised. It is, however, sufficiently common to make it appropriate to draw attention to its features at a time when head injuries, both in the war and in the blackout, are on the increase. In the case reported here, the patient would certainly have died if he had not been operated on at the right moment.

Horrax and Poppen (1936) believe that chronic subdural hæmatoma is becoming commoner, no doubt owing to modern road traffic. Whereas in 1925 Putnam and Cushing found 5 cases in nine years at the Peter Bent Brigham Hospital, Horrax and Poppen found 18 cases in two years at the Lahey Clinic. They divide the patients into three main types: (1) those in whom intracranial symptoms develop many weeks after a cranial injury; (2) those sent in with a diagnosis of intracranial tumour; and (3) those admitted with occasional headache only. Kennedy and Wortis (1937) have studied the acute variety and conclude that it occurs in 9–13 per cent. of all head injuries, and that it is four times as common as the classical middle-meningeal hæmorrhage. They found 72 cases between 1912 and 1936 at the Bellevue Hospital. It is important to note that in about a third of the cases the hæmorrhages are bilateral. In the acute variety they include all cases in which symptoms develop a few hours to twenty-one days after the injury. They suggest that the hæmorrhage may come from a cerebral laceration or a cortical vein, whereas in the chronic variety Trotter (1914) described it as coming from a tear of a vein at its junction with the superior longitudinal sinus. The chief symptoms and signs are focal signs of hemiparesis, waxing and waning consciousness or progressive stupor, a pulse-rate below 60, a dilated pupil on the affected side, and bloodstained cerebrospinal fluid (C.S.F.). Other prominent symptoms are initial unconsciousness followed by a lucid interval of hours or days, vomiting, headache, incontinence, cranial-nerve palsies (particularly a lower facial weakness), motor weaknesses, absent abdominal reflexes, and altered plantar reflexes. It is the absence of a single clear-cut clinical picture that makes diagnosis so difficult, and bilateral hæmorrhages confuse the signs even more.

### CASE-RECORD

A man, aged 73, was knocked down by a car on July 25, 1939. He was dazed but able to get up and was taken home by car. There was a cut on the middle of the forehead, and small bruises elsewhere; there was some shock and vomiting and a complaint of frontal headache but no recollection of the accident. When seen by Dr. Nelson Jones (for Dr. D. G. Carmichael) his temperature was 97° F., pulse-rate 54, and blood-pressure 135/90. Pupils equal and reacting; other reflexes normal.

July 26: left-sided headache; otherwise as before. Radiography revealed Paget's disease of the skull but no fracture. On the 27th the left pupil was sometimes smaller than the right and reaction less brisk. Reflexes on right brisker than left. Right extensor plantar. Slight dysphasia. Lumbar puncture revealed yellow C.S.F. Headache continued, for which bromide and

chloral were given. After this he began to be somewhat drowsy, and deep reflexes were obtained only with reinforcement. On the 29th knee-jerks and ankle-jerks were absent, and plantar reflexes were extensor on both sides. Since there was no improvement during the next few days, he was seen by Dr. Russell Brain and myself on July 31, when the neurological signs were as mentioned above, but he had to be stimulated to answer questions. Although we suspected that there might be a subdural hæmatoma, we thought that these few signs could be caused by cerebral œdema, and we therefore instituted treatment designed to reduce this.

On August 2, at 2 P.M., the patient's condition suddenly became much worse, and, since it was now clear that he would certainly die unless something were done promptly, he was transferred to Nuffield House, Guy's Hospital, where I asked Mr. D. W. C. Northfield to see him with me at 5 P.M. The patient was now deeply comatose, with blood-pressure 140/80, pulse-rate 60, and deep and periodic respiration. No verbal response. Resented nose pinch, but not pinprick. No rigidity of the neck. Optic disks normal. Left pupil brisker than right, but both sluggish. Right grasp reflex (does not move right arm well). Tendon-jerks: arms, right brisker than left; legs, brisk and equal; abdominals, absent; plantars, extensor. Sensory changes could not be elicited. A subdural hæmatoma was diagnosed, and an operation was performed by Mr. Northfield, assisted by me.

*Operation.*—Local anæsthetic was injected in four places, in the frontal and parietal regions of the vertex on both sides, in anticipation of the possible necessity of exploring all these regions. The left frontal region was explored first through a burr hole, and 2 oz. of dark bloodstained fluid was aspirated from the subdural space. This was not so syrupy as the fluid in the more chronic cases. The cavity was washed out with saline; but, since the brain showed no signs of expanding at once, it was difficult to be sure that the cavity was completely emptied of blood. There was no visible membrane on the surface of the brain, and the convolutions could be clearly seen. The right side was then explored through a frontal burr hole; the subdural space contained a small quantity of clear fluid but no hæmatoma. Both skin incisions were sutured without drainage.

The patient was distinctly less stuporose at the end of the operation and during the night following. The next day (August 3) he was rather more stuporose but could swallow a little. His fluid intake was supplemented with rectal saline. On the 4th he was still more deeply stuporose and not swallowing so well. Nasal feeding was instituted, 8 oz. every two hours. Left pupil larger than right. Reflexes all absent, except plantars, which were extensor. That evening he was rather better and responded to speech with an effort. Knee-jerks now present, but pupil still dilated. Lumbar puncture revealed a slightly straw-coloured fluid under a pressure of 40 mm. On the 5th his condition was about the same, except that the arm tendon-jerks and the ankle-jerks had returned. Plantars still extensor. Left pupil still larger than right. A needle through the left frontal burr hole drew off 46 c.cm. of thin dark fluid.

August 8: there is slow but steady improvement in his general condition; although he has slept a fair amount, he is now alert and has been holding long conversations since the morning of the 6th. He occasionally gets a little giddiness, with a sensation of rotation when he is turned in bed, and is beginning to resent the elevation of the foot of the bed, which he thinks gives him a headache. He is no longer incontinent, and pulse-rate and temperature are low and steady. He sleeps fairly well and is no longer confused. There is slight rigidity of the neck. Pupils are both small, with a brisk reaction. There is slight left lower facial weakness. Power in the arms and legs is good and equal. Tendon-jerks are brisker in the left arm than the right. Both lower abdominal reflexes obtained for the first time. Knee-jerks and ankle-jerks absent (the latter have been present from time to time). Plantars still extensor in the big toes, although the other toes flex. He has been receiving each day 120 oz. by nasal tube and 20–30 oz. by mouth. Since the power of swallowing has returned, the nasal tube has been removed. A needle inserted through the left frontal burr hole withdrew 13 c.cm. of dark fluid under low pressure.

August 10: 6 c.cm. of slightly thinner fluid withdrawn through the same hole from a cavity about 0·5 cm. below the bone. August 12: is taking well by mouth and is alert. Gets occasional headache which is made worse by taking the bed off its blocks for twenty-four hours. Plantar reflexes mainly flexor, with a tendency for the big toe to go up. Tendon-jerks variable; ankle-jerks usually absent. A few days after this he was sent to the country, in view of the crisis then developing. He has steadily improved and, when seen on Jan. 14, 1940, was completely normal. He had no headache. His wife suggested that he was a little forgetful, but no more than was to be expected in a man of his age.


### SUMMARY

A man, aged 73, having sustained an injury to the head, was at first not unconscious for more than a moment, but complained of headache and became gradually drowsy during the next eight days, then suddenly deeply comatose. In spite of the relative paucity of neurological signs a subdural hæmatoma was diagnosed and found at operation. Complete recovery followed.


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## PROBABLE CHORIONEPITHELIOMA IN A VIRGIN OF SEVENTY-ONE


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ALTHOUGH chorionepithelioma has been reported in patients aged 7–70 (Soresi 1936), it has with few exceptions affected parous women. The case reported here combines the unusual association of chorionepithelioma, virginity, and senility.

### CASE-RECORD

A single woman, aged 71, was admitted into the gynæcological department of Dulwich Hospital because a pelvic tumour had been discovered by her doctor. She had been healthy all her life and had neither undergone any operation nor had had any serious illness. The menopause had taken place before the age of 50, and there was no history of pregnancy or of any gynæcological lesion. This was confirmed by her relations, who further stated that they had noticed a gradual decline in her general condition for the past six months. The patient said that she had felt well until three months ago, when she began to complain of severe pains in the lower abdomen. This was followed a week later by vaginal hæmorrhage, which had since continued for two or three days a week, accompanied by intermittent aching pains in the abdomen. She did not complain of any urinary symptoms but had recently become constipated and had lost much weight.

Her general condition was fair, and despite the loss of weight her abdomen was still well covered with fat. Nothing abnormal was found in the heart, lungs, kidneys, or nervous system. In the abdomen a mass could be palpated in the middle line, its upper pole being midway between the symphysis pubis and the umbilicus. Since the hymen was intact, a vaginal

examination was made under a general anæsthetic. The condition of the vulva, cervix, and vagina was consistent with virginity, and on palpation of the posterior fornix a hard fixed mass, connected with the uterus, was discovered. Although the obesity of the patient made a bimanual examination difficult, it seemed that the abdominal tumour was uterine rather than ovarian. A provisional diagnosis was made of malignant disease of the uterus, possibly associated with fibroids. On the ninth day after admission the patient's condition became worse, after that the cachexia rapidly increased, and a week later she died.

*At necropsy* the uterus was found to be enlarged to the size of a four-month pregnancy, and on the anterior surface there were two large subserous metastases. The pouch of Douglas was completely filled by a soft necrotic tumour spreading from the uterus and fixed both anteriorly and laterally to the rectum. The right broad ligament was also invaded by direct extension from the uterus, and the right tube and ovary were buried in the tumour but were not enlarged. The left tube and ovary were not involved and were of normal size. Neither ovary contained any cysts, and each was consistent in appearance with the age of the patient. There was no invasion of the bladder. The whole of the upper two-thirds of the corpus uteri was filled and the walls were invaded by a friable dark-red hæmorrhagic tumour, of which the lower free edge was shaggy, while the cervix was absolutely free from invasion.

The tumour both in the uterus and in the pouch of Douglas was in an advanced stage of necrosis. The lymphatic glands in the pelvis, besides those in the hilum of the liver, were also involved. Both lungs were riddled with small metastases, few being more than 1–2 cm. in diameter; the very small ones were distinctly hæmorrhagic, but the larger ones were pale in the centre and pinkish-red round the periphery. The liver was firm, slightly enlarged, and had a yellow toxæmic appearance; it contained several large pale metastases. The remaining organs were normal.

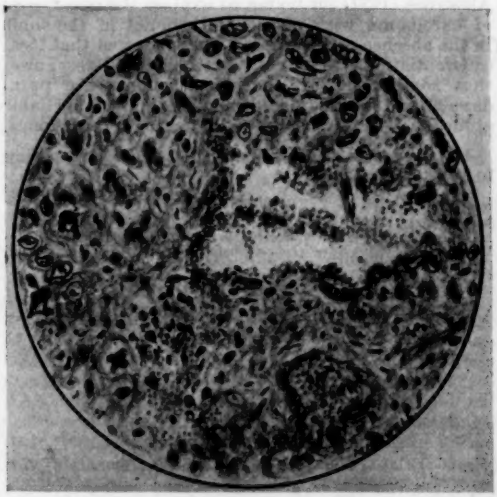

FIG. 2—Fibroblasts, extravasated red blood-cells, and syncytial cells showing polymorphism.

*Microscopic examination.*—The predominating cells were syncytial (fig. 1); large multinucleated masses of cytoplasm were scattered throughout the section and exhibited a considerable degree of polymorphism (figs. 2 and 3). There were also many smaller and heavily staining cells of an intermediate type, while those cells derived from the Langhans' layer were the least numerous (fig. 1). Extensive areas of hæmorrhage were also common (fig. 4) and in several places were closely related to the syncytial cells.

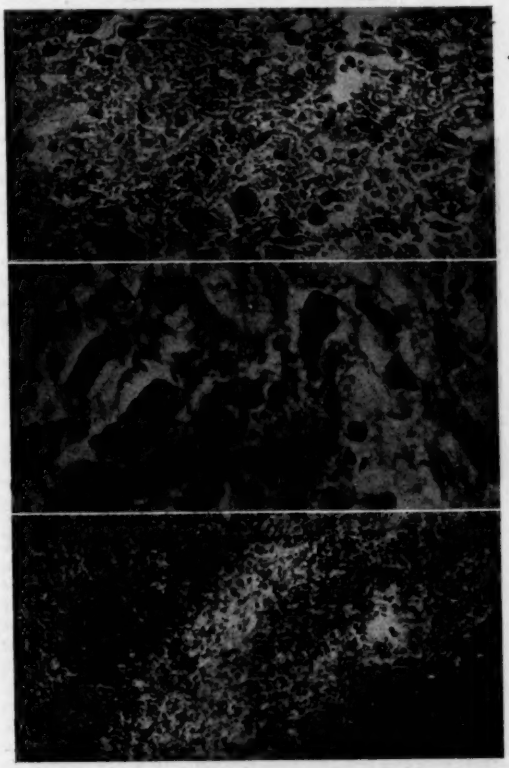

FIG. 1—Large multinucleated cells and Langhans' cells. (× 200.)
FIG. 3—Types of syncytial cells. (× 600.)
FIG. 4—Syncytial cells and cells of intermediate type; two areas of hæmorrhage. (× 100.)

## COMMENT

The diagnosis of chorionepithelioma in this case rests entirely on the histology, although it receives some support from the macroscopical appearances, the dark-red friable tumour in the uterus and the small hæmorrhagic metastases in the lungs being typical of this condition. Unfortunately it lacks the confirmatory evidence of an Aschheim-Zondek test, for the final diagnosis was not suspected when the patient was alive. However, the microscopic section has been submitted to several competent authorities, who with one exception had no hesitation in accepting it as a typical and highly malignant chorionepithelioma. The origin of the tumour in this case is purely speculative, for the question of pregnancy does not arise. The extensive involvement of the corpus uteri leaves little doubt that that was the primary site, but there is a slight possibility that the tumour may have originated from an ovary. Since no microscopical examination of the ovaries was made, all that can be said is that the left ovary was normal in size and was not involved; that the right ovary, although buried in a mass of tumour, was not noticeably enlarged; and that neither ovary appeared abnormal to the naked eye. The most reasonable explanation is that the tumour originated from a teratoma of the uterus; another explanation is that it developed from a carcinoma of the corpus uteri.

Ahlström (1931), in trying to explain the occurrence of carcinoma with chorionepithelioma in the male in the absence of a teratoma, has suggested that local differentiation is the cause. Mathieu (1939) recognises that some cases of chorionepithelioma are paradoxical and would place them in the irreconcilable group, and that is where this case undoubtedly belongs.

I wish to thank Sir Frederick Menzies for permission to publish this case.

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## A NEW WAY TO DETERMINE BLEEDING-TIME

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AND

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The usual method of determining the bleeding-time is that described by Duke (1912), who makes a stab wound in the finger-tip or in the ear lobe after careful cleaning. The blood flowing from the wound is sucked away with tissue-paper every 15–30 sec., without the wound being touched. To obtain more accurate results, Spitz (1923) has suggested making a wound of fixed depth in the ear lobe with a Francke's blood lancet and rubbing the lobe firmly before measuring the bleeding-time. In this way a maximal quantity of blood will flow from the ear lobe. Even then, as Fonio (1928) and others admit, the determination of the bleeding-time is inaccurate. This is due to the fact that the thickness of the skin differs in different places and in different people, with the result that the resistance to the blood-flow varies. Moreover, this resistance is enhanced by the edges of the wound adhering together, and the direction of the stab wound influences the direction in which the skin splits and the relative direction of the vessels. These factors may hinder hæmorrhage so much that a small punctured wound may show no increased bleeding-time in hæmophilia, although an operation would be fatal, because tension and adhesion of the skin play no part in an open wound, only the contraction of the vessels and the formation of thrombus being of importance.

For these reasons we have developed a method which imitates as nearly as possible the circumstances of an open wound. First, the ear lobe is made hyperæmic by rubbing. Next, it is pressed against a thin steel plate—e.g., a razor blade—with a circular opening 4 mm. in diameter. A small part of the lobe is protruded through this opening and cut off with a razor. Thus an open wound is obtained, in which many capillaries have been cut. The wound should preferably not be made on the edge of the lobe. The blood is sucked up every half-minute with a separate portion of filter paper without the wound being touched, and the number of drops on the paper indicates the bleeding-time in half-minutes. The force with which the ear lobe is pressed against the steel plate can be made constant by fastening a steel spring to the plate and fixing the lobe in between. This method is not very painful, probably owing to the pressure; at any rate it is much less painful than a puncture.

To find out whether with this method sufficiently consistent results can be obtained, we have determined the bleeding-time of 85 people, each twice with an interval of four hours. The difference between the two records was only in a few cases more than a minute. The average bleeding-time estimated by this method in 450 tests was 3 min. 25 sec. By Duke's method an average bleeding-time of only 2 min. 30 sec. was obtained. The increased time obtained by our method is important in scientific investigations because the margin of error is thus reduced. The longer the bleeding-time, the more accurately the difference between two groups of observations can be shown.

To summarise, this method produces consistent results, is not painful, and leads to a longer bleeding-time, hæmorrhage not being hindered by the edges of the wound adhering together and by tension of the tissues. In this way some cases of hæmorrhagic diathesis can be detected which could not be discovered by previous methods.

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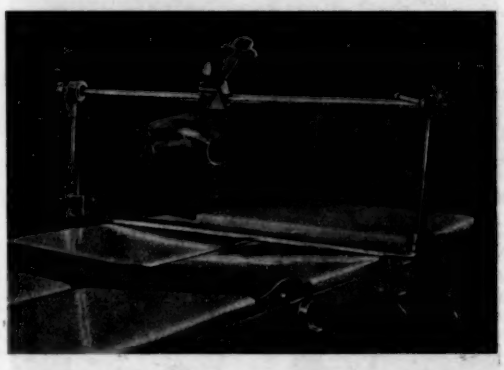
## New Inventions

### AUTOMATIC RETRACTOR FOR ABDOMINAL SURGERY

The retractor and stand here illustrated is for use in deep pelvic and other abdominal operations and has been made for me by Powells Ltd., Bombay. The use of this retractor, which holds the tissues firmly and exposes to view a large field of operation,



dispenses with the services of a third surgical assistant, who would otherwise to required to hold a retractor. Since this apparatus is not placed between the patient's legs, it does not interfere with the arrangement of sterilised towels and with the passage of instruments into the rectum or into the vagina; nor does it cause pressure on the genitalia.

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Parsi General Hospital, Bombay.

"... Studying medicine is probably the worst nervous strain you can put any man through. It's like having a wife who is pregnant all the time and never delivered; only when the time for the delivery comes, as in a nightmare, it turns out to be you, and not your wife, who have to be delivered."—Augusta Tucker in "Miss Susie Slagle's," London, 1940.

# MEDICAL SOCIETIES

## ROYAL SOCIETY OF MEDICINE

### EPIDEMIOLOGY AND STATE MEDICINE

THE new president of this section, Dr. J. ALISON GLOVER, delivered his presidential address on April 5 on

**Evacuation**

being some epidemiological observations on the first four months. He recalled that evacuation has been a rare experience to English people: Eton and Westminster Schools and Oxford University, he said, evacuated in Tudor times to escape the plague, and he showed an interesting engraving depicting the flight of many of the inhabitants of the country round Chatham when the Dutch raided the Thames and Medway in 1667; but no migration on anything like the present scale has ever taken place. The Ministry of Health, in addition to preparing the Emergency Hospital Service, also arranged with the local authorities to increase hospital provision for infectious disease in the reception areas. Obstetric areas were defined according to the accessibility of lying-in hospitals, and in these areas 137 emergency maternity homes, staffed by qualified maternity nurses and containing 3700 additional beds, were provided for normal cases. Consultant obstetric services and hospital accommodation were provided for abnormal cases, and arrangement was made for the prompt isolation of cases of puerperal pyrexia. The Ministry also agreed with the British Medical Association for the domiciliary treatment of evacuated children. The Medical Research Council organised 2 central and 23 subsidiary laboratories to augment the existing facilities. In many areas water-supplies, sewerage and drainage were also organised. The most imminent risk seemed to be the spread of those epidemic diseases of which the seasonal maximum falls in August—poliomyelitis, diphtheria, scarlatina, enteric fever and dysentery. Diphtheria and scarlet fever showed high incidences in 1938 and recent years, and seemed likely to flare up still higher if town carriers and country susceptibles were freely mixed. Up to mid-July poliomyelitis seemed to threaten an incidence as great as that of last years; both dysentery and enteric showed increases in the two months before the war. Yet how providential was the outcome. The incidence of infectious diseases in the first four war months was remarkably low. September is one of the healthiest periods of the year for droplet infections. The double-shift method of schooling enabled the children to spend half their time in the open air playing organised games and walking in the splendid autumn weather. This acclimatised the town children and allowed the native children to acquire immunity to unfamiliar strains. The notified cases of poliomyelitis were only a third and those of diphtheria and scarlet fever only two-thirds of the figures for the corresponding period of 1938: 16,000 against 24,000. Strong efforts were made in some areas to immunise the children artificially, but the difficulty of obtaining parental consent hindered progress. Diphtheria is school-spread more than most other diseases, and the closure of the schools in the evacuation areas, their partial closure in the neutral areas and the double-shift method in the reception areas, helped to diminish the incidence and to produce satisfactory conditions. The prevalence of scarlet fever fell rapidly from the end of July, and at the end of August the incidence was below the minimum for the last nine years. A sharp rise towards the end of September never reached the figure of the year before. In the great cities the incidence of these diseases was quite out of proportion to the number of children remaining in them. In late October only 47 per cent. of the normal child population were in London, but the cases of scarlet fever numbered only 18 per cent. of the figure for the previous year; the incidence of diphtheria was only 23 per cent. This low rate was probably due to the removal of susceptibles from the cities, and the closure of the schools to the children who remained behind.

Despite the large migration of expectant mothers, Dr. Glover went on, the figures for puerperal pyrexia showed a decrease—a result which reflects much credit on the arrangements made by the authorities. A four months' period began with an epidemic of chickenpox, and closed with a very extensive outbreak of German measles. The prevalence of German measles was greater than anything in Dr. Glover's experience. Although the deaths from infectious disease did not decrease in quite the same proportion as the infections, there was nevertheless a substantial reduction. The percentage reduction from the 1938 figures was—scarlet fever 27, diphtheria 16, enteric 34, diarrhœa and enteritis under two years, 27. The statistics for the special schools were extraordinary. Measles broke out in only one of the 17 schools examined, and the attack-rate was 67 per cent. Whooping-cough occurred only in five, epidemic diarrhœa only in four, scarlet fever in two, and diphtheria in two special schools.

In the evacuation, incomplete as it was, a number of persons ten times the size of the original expeditionary force were moved and billeted in four days with wonderful success and punctuality. Hundreds of thousands of rural homes had new inmates who might have brought new strains of infection. The daily lives of millions of school-children were completely altered by school closure and the double shift; many special, day and nursery schools became residential. In the absence of immediate air attack, exaggerated criticism has entirely obscured the extraordinary good record of the fight against infectious disease during the first four months. Credit is due to the careful preparation and hard work of the evacuation department of the Ministry of Health, and to the public-health services, ably seconded by the domiciliary medical services, the devotion of teachers and school nurses, the generous care so often shown by the foster-parents, and nature's gift of a glorious autumn. The results are evidence of the basic soundness of the environmental hygiene of this country. Other things which seem to cloud evacuation had their epidemiological silver lining. The reluctance of some to move and the rapid drift-back simplified billeting, left the children most suited to country life, and kept children in the open air for double the usual time. Even the much-deplored school closure contributed to the result. The record proves the soundness of the policy of dispersing the children in billets, in preventing the spread of airborne disease. A policy of concentration in camps has been much recommended, but previous experience suggests that it would have produced far less satisfactory results. In contagious disease the record is less satisfactory, and in pediculosis it is disappointing. The evacuated children have benefited enormously in health, and have shown more immunity and far better school attendances than the native children. Many of those who returned home still show, after some months, the stimulating effects of their experience on their growth and well-being.

A vote of thanks to the President for his address was proposed by Sir ARTHUR MACNALTY, seconded by Dr. J. D. ROLLESTON, and carried with acclamation.

# PANEL AND CONTRACT PRACTICE

## An American View of European Health Insurance

In the last few years American administrators have been taking a good deal of interest in European systems of health insurance because of the imminence of developments on these lines in the United States. In 1936 Dr. Falk produced his book "Security Against Sickness," in which he discussed the need for group payments of insurance costs in America and described systems of insurance in force in Germany, France, Denmark and Great Britain. Prof. Barbara Armstrong's new book, "The Health Insurance Doctor,"[1] deals with the relationship between state, doctor and patient in three democracies, England, Denmark and France. Mrs. Armstrong is an observer trained in law and economics, professor of law in the University of California, and was formerly executive secretary of the California social-insurance commission. She approaches health-insurance administration in the three countries along a common plan, first summarising the system of insurance, then dealing with medical benefit and such questions as remuneration and disciplinary procedure, and finally trying to estimate the attitude of the medical profession to the prevailing system. It is not easy to acquire enough background to form a balanced judgment on the health services of a foreign country in the course of a comparatively short visit—the difficulty is not merely the obvious one of language, but of securing sufficient width of approach to ensure that the data collected are really representative. Nevertheless, Mrs. Armstrong's study of British practice rings true, though it does contain a few very minor inaccuracies and some expressions of opinion that are a little odd. Thus, discussing the report of the Scottish departmental committee on health services, which recommended the extension to dependents of national health insurance, she writes that "there is a fairly strong tradition that things which are under consideration for the United Kingdom as a whole are tried out in Scotland; general medical and lay opinion has it that the action of this Scottish body is prophetic of what may be expected in the course of time from the Ministry at Whitehall." She recognises that changes are impending in the voluntary hospital world, and maintains that the almoner system strikes at the very heart of the voluntary-hospital tradition, being, in fact, largely a camouflaged means test never really acceptable. She recalls that the Royal Commission on National Health Insurance did not recommend making institutional care a statutory benefit chiefly on the ground that this would be prejudicial to the voluntary-hospital tradition.

In Denmark, on the other hand, hospital benefit is compulsory. The hospital system there is regarded as a kind of insurance for the whole population. Hospitalisation is urged as a matter of public policy, and the tendency is to develop the hospital system still further, supplementing existing central hospitals by establishing smaller units at the periphery and by placing specialists in these units as necessary. The insurance system covers the children of an insured person as well as himself; wives are expected to insure themselves and commonly do so. Cash benefits have been regarded as less important than in this country, though there is a growing recognition that adequate cash allowances are valuable alike from health and economic standpoints. There are in Denmark two alternative methods of paying insurance practitioners—the method employed in Copenhagen and increasingly throughout the rest of the country, chiefly capitation with supplementary fees for special services, and that which makes payment for each unit of service according to a fee schedule. There is similar official provision for the employment and payment of specialists, though it must be remembered that in Denmark specialisation is controlled to an extent quite unknown in this country. There is no medical referee system, neither the societies nor the doctors feeling any need for it.

The insurance system of France is the youngest of the three—it has been in operation only since 1930—and it has not yet succeeded in resolving its difficulties as have Denmark and Britain. On paper the aims of the scheme are excellent, but the money necessary to work the scheme as drafted is not applied to it, and it is not surprising that there have been differences between doctors and the administration. One fertile cause of trouble lies in the fact that while insured persons are required to find 20 per cent. of the cost of medical treatment the cash payments made to them are based on a standardised schedule of fees which may bear little relation to those charged by individual doctors, who can charge what fees they please. Another source of difficulty is that French doctors seem to be more concerned than their Danish and British colleagues with the implications of national health insurance certification in relation to professional secrecy.

Mrs. Armstrong sees in French insurance some things that might be borrowed in framing a pattern for the new world; but in the main her sympathies are with the Danish system, for she believes that Danish practice does most to make the doctor a real force in the public-health organisation of the country, creating a professional life calculated to stimulate the doctor to extend his interest beyond the purely curative problems of his daily practice. "The journals of the Copenhagen Medical Association," she writes, "have been carrying an increasing number of articles on preventive medicine. These have been emanating not from public-health officials or university professors, but from practising health-insurance doctors, who urge that the times demand of the family doctor that he take his proper place as the unit in a great preventive system for eliminating illness itself."

1. The Health Insurance Doctor. By Barbara N. Armstrong. London: Humphrey Milford, Oxford University Press. 1939. Pp. 264. 18s. 6d.

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THE LERICHE TREATMENT OF SPRAINS.—Prof. René Leriche has for several years taught that most sprained joints are not the result of anatomically demonstrable rupture of certain ligaments but of changes in the nerves amenable to an injection of procaine. At a meeting of the French Academy of Surgery on Jan. 10 Dr. Mondor admitted the validity of Leriche's view as confirmed by a dozen cases of sprained joints in which, at the time of operation, Leriche had failed to find ruptured ligaments, but he countered this evidence with the case of a 32-year-old woman operated on for a sprained knee at the Bichat Hospital. The clinical picture in this case was typical of the sprained knee of moderate degree following a trifling accident, but at the operation gross and multiple lesions of the structures involved were discovered and dealt with on surgical lines. This observation was confirmed in three similar cases by Dr. Ameline who agreed with Dr. Mondor in not accepting the Leriche teaching concerning the genesis of sprains without reserve.

# REVIEWS OF BOOKS

## Tumors of the Skin

*Benign and Malignant.* By JOSEPH JORDAN ELLER, M.D., attending dermatologist, City Hospital, New York. London: Henry Kimpton. 1939. Pp. 607. 45*s*.

AMONG many novel features in this notable production Dr. Eller's chapter on the diagnosis and treatment of malignant tumours is as lucid and detailed as any in the English language. The author bases his recommendations for treatment on a personal experience of twenty years, so that in many instances he can illustrate his results photographically ten or more years after the patient was treated. Even more impressive are the diagrams of the various types, sizes and locations of carcinomata and the practical discussion of the different methods of therapy which may be used for each lesion. The recommendations under this heading are given in order of the author's preference —e.g., radium, X rays, surgical excision or the diathermy knife, with or without immediate or subsequent plastic repair. For those whose bent is surgical there is a simple account of the modern developments in plastic technique, illustrated with diagrams of the incisions and sutures available in different situations in the "lines of cleavage," while skin grafts and their varieties are not neglected. From the dermatological aspect the book reaches a high standard. The many clinical photographs and microphotographs, all apparently from the author's collection, stand comparison with any. There is a comprehensive bibiliography.

## Pulmonary Tuberculosis

*Pathology, diagnosis, management and prevention.* By G. GREGORY KAYNE, M.D. Lond., M.R.C.P., tuberculosis officer, Middlesex county council; WALTER PAGEL, M.D. Berlin, pathologist, Papworth Village Settlement; and LAURENCE O'SHAUGHNESSY, M.D. Durh., F.R.C.S., consulting and thoracic surgeon to Preston Hall. London: Humphrey Milford, Oxford University Press. 1939. Pp. 565. 42*s*.

WHEN it is remembered that not long ago a two-volume work of 1100 pages appeared on the treatment of phthisis by collapse therapy, it is clear that to produce a textbook of reasonable dimensions covering all aspects of pulmonary tuberculosis is now an ambitious undertaking. If such a venture is to succeed it must provide a new slant on old problems, and that is what Dr. Kayne and his colleagues have done. For originality and completeness the first section, on the pathology and natural history of the disease, deserves pride of place; it is one of the best accounts of the evolution of pulmonary tuberculosis that has been written. The question of dissemination and the immediate post-primary sequelæ is a little involved but well repays careful study by one who is not primarily a pathologist. The clinician would have been glad of some elaboration of the statement that "fibrous tissue is easily converted back to the original cellular state." He may be persuaded that *in time* fibrous tissue can be absorbed and he will readily appreciate that it could be destroyed by advancing caseation, but the idea of its "conversion" to cellular tissue is contrary to the first principles he was taught at his medical school.

Much discretion has been exercised in the section on diagnosis, and, in keeping with the modern outlook, half of this is about radiology. How to search for the tubercle bacillus is described at length; the tuberculous patient of today must be finding it increasingly difficult to acquire and maintain a "negative sputum." Another valuable section deals with the examination of the blood, a side-line of the investigation of the patient that is often neglected. An earnest attempt has been made to discuss prognosis, the most difficult of the clinical arts to cultivate and so individual an affair that it can only be learned by experience. The guiding principles on which an accurate prognosis of phthisis can be founded are clearly laid down.

Management takes up nearly half the book, and although collapse therapy occupies a large proportion of this the account is well balanced. Two pleasing features are the short historical review of collapse therapy and the few pages on the physiological and pathological basis of surgical intervention, which will dispel many misconceptions as to the aim and limitations of pulmonary "relaxation." Thereafter the different methods of obtaining collapse are taken seriatim, the indications and contra-indications wisely being given more attention than operative detail. While a distinct bias in favour of the total paravertebral thoracoplasty can be detected, yet the advantages of a partial or spitzen-plasty are fairly enumerated. The more recent developments in this field, such as Semb's operation and the extrapleural pneumothorax, are given due recognition.

## Synopsis of Surgery

(11th ed.) By ERNEST W. HEY GROVES, M.S., M.D. Lond., F.R.C.S., consulting surgeon to the Bristol General and Municipal Hospitals; emeritus professor of surgery, Bristol University. Bristol: John Wright and Sons. 1940. Pp. 714. 17*s*. 6*d*.

THIS book has become one of the props of the final-year student, and a familiar friend in hospital and study. The new edition includes an account of the Böhler technique in fracture treatment, and the subject of cleft palate has been carefully revised. The operation for cleft palate is now described according to the principles laid down by Veau, while the older operations have been omitted. The book succeeds in fixing the main points of diagnosis and treatment rapidly in the mind of the reader. An example of how information can be quickly and easily imparted is the table of special diagnostic tests for tuberculosis. Is it a fact, though, that the opsonic index is still considered a reliable indication of the effect of tuberculin? And the statement that only 25 per cent. of cases of intussusception occur before the age of one year and 50 per cent. before the age of ten years is not in accord with the general conception of the disease as one affecting babies between six and ten months.

This is one of the short cuts to rapid revision for which both the lecturer and the candidate for examination have been and will be grateful.

## Minor Surgery and Treatment of Fractures

(22nd ed.) By GWYNNE WILLIAMS, M.S., F.R.C.S., surgeon, University College Hospital. London: J. and A. Churchill. 1940. Pp. 472. 12*s*. 6*d*.

THIS is one of the most practical, simple and useful guides for house-surgeons, and it is also cheap. Mr. Gwynne Williams has extensively revised the text and added some new illustrations. The methods he recommends are simple and easy to apply, and few surgeons will quarrel with his selection. He leaves little for criticism. In strapping varicose ulcers the method depicted is apt to lead to excoriations of the skin at the edges of the strips unless vertical pieces of plaster are placed first on the inner and outer sides of the leg. Moreover, elastic strapping which is wound

on like a bandage is more effective than the short strips of zinc oxide plaster shown. The reader is told that the colon of a colostomy patient will empty itself a few minutes after a pint of warm water has been run in. This is very rarely the case. The toilet of a colostomy usually consumes at least ½ hour every morning. The line drawings show clearly what the author has in mind, though plaster-of-paris should surely be made dead white and something has happened to the shape of the child's buttocks in fig. 225. These are all small points, and the resident who follows the instructions given will not go far wrong. There is an excellent chapter on anæsthetics by Dr. H. N. Webber.

**Environment and Heredity**

By OLIVE D. MAGUINNESS, M.Sc., D. ès Sc. London: Thomas Nelson and Sons. 1940. Pp. 216. 2*s.* 6*d.*

MANY people are prepared to make assumptions about the inheritance of human characteristics, but few have any sound knowledge of the principles of genetics or of their application to man. This is the more deplorable in that the most pressing social problems of the day, in particular those of health and education, have important genetical aspects. But good popular books on human heredity are rare. It is easy enough to explain the basic principles as illustrated by the inheritance of clear-cut characters in plants and animals. But it is equally essential that the layman should fully realise the uncertainties and the present difficulties in applying these principles to human affairs. The author of this book has combined skilfully and in a small space a clear exposition of the laws of inheritance with a sound discussion of their possible application to man. As an educationist she is naturally most interested in mental characters and the relative influence of heredity and environment on them. The most important recent investigations on this subject are ably summarised. In view, however, of the differences of opinion on the social value of the characteristics measured in intelligence tests, the critical reader would no doubt like some information on the nature of these tests. Some also will feel the inadequacy of the conditioned-reflex theory of learning, which is presented without discussion of the difficulties in its application such as those which the Gestalt psychologists have attempted to resolve. In view of the author's evident desire to dispel unfounded illusions, it is surprising that she has not dealt with the eugenists, some of whose proposals have been made with no regard for modern genetical research. But in spite of these deficiencies this is without doubt an excellent introduction to the subject. It affords little encouragement to those who would find biological justification for the present injustices in our social system.

**Problèmes actuels de biologie générale et de pathologie expérimentale**

By HENRI BENARD. Paris: Masson et Cie. 1939. Pp. 173. $1.05.

IN spite of its rather forbidding title, this book consists of six rather delightful essays or lectures, the titles of which are:—

(1) Respiration cellulaire; (2) Intoxication cyanhydrique; (3) Diabète pancréatique expérimental; (4) Mode d'action de l'insuline; (5) Le glucose et sa dégradation; (6) Rachitisme expérimental.

There is a certain continuity of thought and construction between the first and second and between the next three, but each chapter begins with a historical introduction and ends with more recent work and can be read without reference to the others. The essays have no bibliography but a few authors of all nationalities are named in the text. They are simply written with an abundance of structural formulæ and illustrations, and in consequence are easy to read. Students or lecturers should find them valuable when they want to get a general idea of any of the problems considered. The spelling of one or two of the proper names is not accurate, hardly anything is said about rickets in dogs and Young's work on the production of permanent diabetes by pituitary injections is not mentioned at all. These, however, are minor blemishes in essays which set out to give a balanced review of the subject, and probably the author would be the first to admit them. The book has a simplicity and charm which will appeal to those who are weary of the other sort of review.

**Standard Methods**

*of the Division of Laboratories and Research of the New York State Department of Health.* (2nd ed.) By AUGUSTUS B. WADSWORTH, M.D., director of the department. London: Baillière, Tindall and Cox. 1939. Pp. 681. 41*s.*

UNLESS one has visited the laboratory at Albany of the New York state department of health it is difficult to realise the comprehensiveness of that institution. This book will, however, give some indication to the general reader, and it sets out the whole of pathological laboratory technique as fully as any in the English language. It covers everything from the selection of glassware and the breeding of animals to the details of technique. The descriptions are clear and complete, and as an encyclopædia for the routine laboratory it will be hard to beat.

**The Rhythm**

*of Sterility and Fertility in Women.* (6th ed.) By LEO J. LATZ, M.D. Chicago: Latz Foundation. 1939. Pp. 151. $1.

EIGHT years ago Dr. Latz, a leading American propagandist for the use of the "safe-period" method of contraception, published this small handbook which tells the basic facts of human reproduction, and puts forward the view that women are fertile during only a few days in the middle of each menstrual cycle as a practical measure of birth-control. Its appeal has proved so wide that Dr. Latz has been able to endow a research fund with the profits.

The safe-period method of contraception is based on the knowledge that ovulation usually takes place in the mid-interval, and on the fairly well-established fact that both ova and sperms are very short-lived. The researches on which these conclusions rest are indicated by Dr. Latz, who also refers to and rejects the view that ovulation can be stimulated by emotional excitement. The variability of the length of the menstrual cycle is treated in close detail, and as a practical measure the following formula for determining the fertile period of the menstrual cycle in any given case is suggested: "the fertile period extends from the 12th to the 19th day before the expected menstruation; plus the days of variation between the longest and shortest cycle of the last eight months, added to the front of the fertile period. The probable date of the next menstruation is determined by taking the longest cycle of the last eight months." The evidence that this rule, if adhered to carefully, is effective is extensive enough to convert even the most sceptical.

The book is written in the form of question and answer, and incorporates much of the relevant literature, but the average medical reader will probably find its sticky and sentimental language irritating.

THE LANCET

*LONDON: SATURDAY, APRIL 13, 1940*

## FOCAL SEPSIS

IT is a little pathetic to read some of the discussions on the pathogenesis of pernicious anæmia that were written before liver treatment became known and CASTLE'S experiments were done. Relevant facts were scanty. Bits of circumstantial evidence were built together in tottering support of this theory or that, preferably one that invoked a bacterial cause. It seemed difficult for writers to remain completely objective. They worked under an almost irrational compulsion: some sort of a theory had to be produced out of those few confusing facts, and somehow it had to be argued for; agnosticism was impossible for them. Would it not have been better, we think now, if they had been content to say bluntly that they did not understand the pathogenesis of pernicious anæmia, and could make no sense out of the knowledge they had of it? Could they not have frankly admitted their defeat, and waited for the solution which, we now know, was on its way? That attitude would have been possible, and no doubt more prevalent, if medicine were studied only in the clear and dispassionate atmosphere of the scientific laboratory. But it came hard to the physician at the anæmic patient's bedside. He could not wait indefinitely; he must try something, and preferably something with a glimmer of a rationale to it. So it came about that his desire to treat disposed him to believe in the most plausible theory available, and not to be too rigorous in his demand for proof. He did not realise how shaky the streptococcal theory of the pathogenesis of pernicious anæmia was, until the "conditioned deficiency" came along to displace it.

There must be other parts of medicine in which our present beliefs are more shakily based than we realise. When a thesis obtains much support from clinicians and little from the more critical kind of laboratory worker it should be suspect, for the laboratory worker is unbiased by the need to apply immediate treatment. The theory of focal sepsis, now some thirty years old, is an example in point. It is offered as an explanation of such conditions as muscular rheumatism and rheumatoid arthritis, which were obstacles to the early triumphant march of bacteriology because they could not be attributed to a direct invasion of tissues by pathogenic organisms. But the organisms could still be blamed if they were allowed to entrench themselves in a septic tonsil and bombard the afflicted joint from a distance, through the blood-stream. "Focal sepsis is a term used to signify the presence of a local and chronic infection, itself yielding few or no symptoms, yet resulting in a state of toxæmia, with or without mild bacteriæmia, and leading to a number of general or remote local disturbances." That is the definition made by Lord HORDER in his foreword to a symposium on the subject in the *Post-Graduate Medical Journal* for February. It is an attractive theory, and it affords clear indications for active treatment: the septic tonsils and the infected teeth, or the doubtful tonsils and the suspect teeth, can be safely and hopefully removed. It is true that removal often fails to cure the rheumatism, and equally true that many people harbour septic foci without suffering remote ill effects. But the theory can be adapted to withstand these criticisms: the wrong focus may have been removed, or a secondary focus already established in an inaccessible place; the joint or the muscle must be sensitised by injury or allergy before it is susceptible to the toxins arising in the septic focus; and on the positive side cases are not lacking where ablation of the focus has been followed by rapid amelioration of the rheumatism. Along these lines the theory has been ably defended by Prof. L. S. P. DAVIDSON,[1] who in discussing "chronic infective arthritis" marshalled varied and weighty evidence for its plausibility, but admitted that "it is not possible to bring forward definite proof." The present symposium takes the problem no nearer finality. Dr. E. WILFRED FISH describes with beautiful clarity the histopathology of the common septic foci in the gums and at the roots of the teeth. He attributes the round-cell infiltration and the osteoclastic and osteoblastic activity in the peripheries of these lesions to the soluble toxic products of the organisms lying among the polymorphonuclear cells at their centres, and points to the general similarity between these mesenchymal tissue reactions and those characteristic of chronic rheumatic lesions round joints and in fibrous tissue; it is plausible to suggest that the one toxin may cause both. Mr. F. C. W. CAPPS gives clear indications for identifying sepsis in tonsils and nasal accessory sinuses. He maintains that the most convincing beneficial results of the removal of foci in these sites are obtained in nephritis: "the most favourable cases are those in which the nephritis is the first acute attack, and not an exacerbation of a chronic condition." A physician might reply that those are precisely the cases in which the disease runs a self-limited course to end in recovery in perhaps 80 per cent. of patients. Dr. JOEKES writes about the gall-bladder as a site of focal sepsis, but is more concerned with the recognition and investigation of cholecystitis than with the evidence that it can or does produce remote effects. Dr. JAMES WILTSIE of Binghampton, New York, believes ardently that focal infection of the colon is a common and important factor in causing rheumatoid arthritis, and therefore aims, by a system of colonic lavage under direct medical supervision, at keeping that organ "as free from the presence of the pathogenic organism as possible, continu-

1. Reports on Chronic Rheumatic Diseases, No. 2, London. 1936.

ously, for many months." Finally, and in contrast with his predecessors, who mostly accept the validity of the focal-sepsis theory with little question, Mr. ALEC BOURNE considers focal sepsis in the female pelvis. He allows that chronic suppurative salpingitis and pyometra will make a woman ill, and that gonococcal cervicitis will give rise to metastatic gonococcal lesions elsewhere, but further he does not go. Chronic cervicitis in his experience is seldom a focus causing general toxæmia or metastatic lesions, and in any case—gonorrhœa apart—it is not a cervicitis at all; the common leucorrhœal discharge is not pus, but simply mucus, desquamated cells and harmless bacteria, and while the cervical mucosa may be hypertrophied or eroded it is not infected.

The symposium, therefore, deals more with the practical application of the focal-sepsis theory than with the academic question of its validity. This is right, for the practitioner has no choice but to act as if the theory were valid, up to a point. There is reason to think that it may be true; therefore the patient must be given the benefit of the chance, provided the treatment involved carries no appreciable risk, and provided that zeal is tempered with moderation. This means that the tooth, the tonsil or the gall-bladder to be removed must be shown to be chronically and macroscopically infected. But there is no proof that the theory is true. Therefore the practitioner can never foretell that removal of a given patient's focus will certainly cure his rheumatism. And those whose minds, for better or worse, have an academic bias will preserve a certain scepticism, coupled with the hope that some day clear light will be shone on the pathogenesis of rheumatism, making its control as effective as that of pernicious anæmia.

## THE CAUSES OF DEATH

ALL who wish to study the secular changes revealed in our mortality records, or—a still harder task—to compare the incidence of particular causes of death between one country and another, are confronted with the changing and differing methods of certification and tabulation. The statement of the cause of death may be one of hundreds of variants, many of which will, of course, be merely synonyms. They must, accordingly, be collated under a reasonable number of broad headings. But what it is proper to place under each such heading must change with advances in knowledge. Sure guidance is available in the manual [1] which has just been brought up to date. Its object is twofold. It acts as a guide to the Registrar-General's staff engaged in tabulation, laying down an assignment to one or other of the International List of all forms of return met with in death certificates, thus ensuring uniformity of practice. Secondly, and equally important, it enables the worker in the field of mortality-rates to learn precisely what death certificates underlie a particular title; without that knowledge he cannot tell whether observed time changes or international differences are not merely reflections of changes or variations in office procedure. The International List is revised decennially to keep abreast of recent advances in medical science and the new manual is based upon the 5th revision by the International Commission which met in Paris in 1938. It is the system of classification which is to be used in England and Wales during the ten years beginning Jan. 1, 1940, and it reveals numerous changes for the better. For instance, the infective and parasitic diseases have been conveniently rearranged into groups according to the type of infective agent (bacterial, spirochætal, virus, &c.), the site-grouping of deaths from cancer has been considerably extended, vitamin-deficiency deaths have been brought together, while the sections dealing with maternal mortality and accidental deaths have been fully revised to meet modern requirements. In the abridged list, under which local variations in mortality must be studied, acute poliomyelitis, cancer of several sites, prematurity and road traffic accidents replace postsyphilitic diseases, liver diseases, senility and ill-defined causes—useful changes which should produce interesting data. Along with these revised lists there comes into force the new method of classifying deaths for which more than one cause is stated upon the certificate. Arbitrary rules of precedence are thereby reduced to a minimum and tabulation more reasonably follows the order of statement of the diseases made by the certifying physician.

1. Manual of the International List of Causes of Death as adapted for use in England and Wales, Scotland and Northern Ireland. Based on the 5th decennial revision by the International Commission, Paris, 1938. London: H.M. Stat. Office. 1940. Pp. 166. 3s. 6d.

## CONCUSSION AND CONTUSION

MUCH of the confusion surrounding head injuries could be avoided if the terms in common use were more clearly defined. Cerebral concussion or commotion describes the physical effect on the brain of a force transmitted to it from a blow on the head. This is the definition which JEAN LOUIS PETIT introduced in his "Traité des Maladies Chirurgicales" in 1790: "un ébranlement plus ou moins considérable dans le cerveau: c'est ce qu'on nomme commotion." Today we speak of a clinical state of cerebral concussion, meaning thereby the state of unconsciousness caused by a cerebral injury, characterised by an instantaneous and complete cessation of nervous reflex activity. This state, after a varying interval, is followed by complete recovery. If this definition, particularly the return to completely normal functions after a short period of unconsciousness, is adhered to, the problem of concussion presents little difficulty. The original diagnosis of concussion will often have to be revised later when signs of more lasting cerebral damage appear, but this is no argument against the definition, for it is in the nature of head injuries that their diagnosis must be written in pencil and not in ink. The transient state of unconsciousness due to concussion has no demonstrable pathological basis. By definition an

autopsy will be performed only if the patient has succumbed to an intercurrent disease or to a concomitant injury to another organ. The findings in such cases fully support the contention that simple cerebral concussion gives rise to functional disturbance only, and its effects cannot be described today in terms of anatomical damage. The cessation of nervous activity, however, could certainly be expressed in terms of electrical units.

If the return to normal after the initial unconsciousness is delayed beyond a few hours, or if after a latent interval signs of cerebral damage reappear, it is fair to conclude that the damage which the brain has suffered has produced more than a purely physiological disturbance. It would be wrong in this type of patient to say that he has passed from a stage of concussion to a stage of cerebral contusion. Cerebral concussion has only one sequel—complete recovery. If prolonged stupor, restlessness, headache or nervous instability are a feature of the clinical picture, the loss of neural function which immediately followed the injury must have been due to something more than a simple concussion. The changes found at necropsy in cases of this type are well known. They affect both neural and supporting elements; ischæmic damage to ganglion cells, swelling of the myelin sheaths, perivascular hæmorrhages and glial activity have been described, and these are the changes which in varying degrees of severity combine to form the pathological picture of cerebral contusion. The damage to nerve cells, glia and mesoderm may be said to be the effect of a severe degree of cerebral "concussion," and probably the same physical mechanism, differing only in quantity, underlies both concussion and contusion. These two terms are commonly applied to stages in one process. It might be better if each were reserved for one entire clinical or pathological process. The stage of unconsciousness may to all appearances be identical in simple concussion and in cerebral contusion. Only future events will reveal the extent of cerebral damage in a clinically or anatomically tangible manner, and will allow a final diagnosis to be made in retrospect.

On this view the late symptoms of head injuries —headache, dizziness, loss of nervous stability and so on—must be regarded as evidence of an anatomical lesion of the brain, that is, of cerebral contusion, and the term post-concussion syndrome becomes meaningless. DANSON[1] has lately laid stress on the organic nature of these sequelæ, which are too often dismissed as "traumatic neurasthenia." Undoubtedly the same organic damage may produce a variety of clinical states in different people, and the late effects of brain injury may be regarded as the resultant of two factors: the severity of the original injury and the constitutional disposition of the patient's nervous system. Not only constitutional dispositions, such as epileptic tendencies, but a number of other pathological states may be awakened by cranial trauma and become clinically obvious. A pre-existent pathological state may also obviously play its part in determining the extent and type of the organic damage itself. With the increasing commonness of head injuries the treatment and prevention of their delayed effects have become of great social importance. We are still far from a satisfactory solution of these questions, but we can at least have a proper appreciation of their complexity.

1. Danson, J. G. *Proc. R. Soc. Med.* 1939, **33**, 51.

# ANNOTATIONS

## A REMINDER TO EMPLOYERS

THE lessons learnt in the last war by the committee on the health of munition workers and since then by various official and unofficial inquirers are clear to all who care to study them.[1] Whether they are being studied and taken to heart in the present necessary drive for greater output is another matter. There can, however, be no doubt that the Industrial Health Research Board has been wise in drawing attention to those features of industrial work to which continual attention should be paid if the national production is to be increased as well as the national health maintained.[2] Its first emergency report is both short and lucid, written in simple terms by different members of its staff, and no-one need hesitate to read it on the score of its being too "highbrow" for the man in the street or the factory. It deals first with the problem of the best length of the working day and week. Within limits an increase in the hours of labour will certainly increase output, but there is a limit. A twelve-hour day in munition factories during the last war produced no more than a ten-hour. In fact, in the striking words of the Health of Munition Workers Committee,[3] "the country cannot afford the extravagance of paying for work done during incapacity from fatigue, just because so many hours are spent on it. . . . Misguided efforts to stimulate workers to feverish activity in the supposed interests of output are as useless as would be the cheers of partisans encouraging a long-distance runner to a futile sprint early in the race." Equally clear now are the benefits of organised rest pauses, of holidays, and of methods to relieve boredom. The board therefore makes these recommendations under this heading: (1) avoid over-long hours and continuous work without intervals for rest; (2) allow Sunday rest and ordinary holidays; (3) reduce boredom by varying the work and by providing distractions, such as music, that do not too greatly alienate the attention; (4) study the arrangement of the work to cut out unnecessary movements and effort; and (5) keep an eye open for danger signals, such as increase in sickness absence, accidents and labour wastage. Records of these last items can be of great value as indices of efficiency and content, and one section of the report is usefully given up to demonstrating to those who have not statistical methods at their finger-tips some simple means of keeping and analysing them. Another deals with the essentials of artificial lighting and the effect of allowing it to be inadequate, and a third with heating and ventilation,

1. *Lancet*, 1939, **2**, 1032, and March 30, 1940, p. 601.
2. Industrial Health in War. A summary of research findings capable of immediate application in furtherance of the national effort. Ind. Hlth Res. Bd. Emergency Report No. 1. H.M. Stationery Office. 1940. Pp. 36. 6d.
3. Interim report, 1917.

both highly important questions at all times but especially so under blackout conditions. The screening of windows and skylights is bound to reduce ventilation to an undesirably low level unless special steps are taken to allow entry and exit of air. Various methods are here suggested. Under different varieties of undesirable environmental conditions accidents, too, have been found to increase, as they do also when the number of inexperienced workers rises. During the war the proportion of such workers is certain to go up and special supervision will therefore be called for, as well as methods for detecting the accident-prone and as far as possible placing them where they will do no harm to themselves or others. Such, in outline, is a report that should have a wide circulation, for the need at the moment is for application of knowledge previously gained rather than for new researches. Where recommendations are made which seem to war-time managers or employers impracticable or needing further research before they can be applied, or where new problems present themselves, the board hopes to be consulted at once.

## ANOTHER TEST FOR OBSTRUCTIVE JAUNDICE

THE name of biochemical tests intended to distinguish between obstructive and toxic or infective jaundice is legion. Most of them are based on some recognised function of the liver. Those in most common use are probably the van den Bergh reaction, the tests for bile in stool and urine, the galactose-tolerance test, and lately the estimation of plasma phosphatase. The rationale behind these tests is fairly well understood. A new test emanating from France [1] is not so well founded in theory, but it claims such a sharp differentiation between obstructive and toxic jaundice that it may prove a useful adjunct to the investigation of these cases. The blood-serum is heated with sulphuric acid and then phosphoric acid and vanillin are added. A colour develops which is very intense with the sera of cases of obstructive jaundice and much less intense with those of toxic jaundice. The authors are not certain what substance or substances are responsible for the reaction, but they are in no doubt as to its clinical usefulness. So many claims have been made in the past, however, for tests for obstructive jaundice, that more information will be required, with trials by other investigators, before the "réaction sulpho-phospho-vanillique" can be regarded as of established value in the differential diagnosis of jaundice.

## SERUM AND SULPHAPYRIDINE

Two papers by Finland [2] and colleagues at the Boston City Hospital serve, if only by repetition, to underline certain principles which may easily be forgotten in the clinical application of the sulphonamide group of drugs. Using blood-broth or defibrinated human and rabbit bloods as their media, to which were added 5 and 10 mg. per cent. of sulphapyridine, they confirmed earlier observations that whatever the number of pneumococci (they used types I, III and V) in the inoculation and whatever the concentration of the drug there is always a preliminary phase of growth of the organism, and, what is equally important, the organism must multiply before the drug can act. Afterwards the fate of the pneumococcus depends mainly on three factors—the size of the inoculum, the concentration of the drug, and the susceptibility of the strain—strains of the same type varying in sensitivity. The natural inferences are that a certain concentration of the drug in the blood (Finland suggests 5 mg. per cent.) is required to deal with a generalised infection, and that in severe septicæmias no amount of the drug will per se save the patient. The next point demonstrated was that sulphapyridine exerts its delayed bacteriostatic or bactericidal action on the pneumococcus in the presence of considerable amounts of the homologous specific polysaccharide, a substance which has a direct neutralising effect on antiserum. Thus the drug might be expected to do good in the late stages of a pneumonia when antiserum is admittedly less effective. Antiserum by itself was found to have a rapid pneumococcidal action which was completed before the sulphapyridine began to act. Lastly, Finland confirmed the "summation" effect of serum and sulphapyridine when used together. These findings from in-vitro tests were confirmed by tests carried out on the blood of pneumonia patients under treatment with sulphapyridine or serum, and they substantiated the clinical impression that a combination of serum and sulphapyridine produces the most rapid amelioration of symptoms. No-one would suggest that every case of pneumonia should be treated with both remedies, but in severe infections, whether with the pneumococcus or other pathogen, there are firm grounds for using a combination of serum- and chemotherapy whenever possible, and at the moment this dictum is particularly applicable to epidemic cerebrospinal fever. The drug seems to act directly on the organism or its enzymes (Prof. H. N. Green [3] has thrown some light on its mode of action) whereas antiserum neutralises the toxins or specific substances of the organism. Together the two remedies pave the way for the third factor—the body's natural defences—to complete the destruction of the invading pathogen.

## IF EVACUATION HAS COME TO STAY

ENGLAND has probably had more experience of evacuating children than any other country, for the children of our so-called upper classes have traditionally spent the greater part of their childhood in boarding-schools. We may learn from this peculiarly English custom that children and parents will accept prolonged separation if the children live in communities where they are cared for and educated by professionals, where there is not the competition of "another home," and where there is opportunity for regular visits. Dr. Alison Glover (on p. 693) tells a convincing story of the success of the September evacuation, but the results of the new registration are said to be disappointing. Perhaps that is because we have begun at the wrong end. The best stimulus to evacuation—short of actual bombs—would be an improvement of conditions in the reception areas. In September people rose to the occasion and accepted household billeting as a temporary measure. As a permanent scheme it arouses resentment. The A.R.P. Co-ordinating Committee, of which Prof. J. B. S. Haldane, F.R.S., is chairman, in a memorandum to the Minister of Health and the President of the Board of Education stigmatises household billeting as the greatest single cause for the failure of evacuation. In this the committee put forward as an alternative plan that our unemployed builders should be set to work at once on a two-year programme to build camp schools for the older children, and nursery centres and hostels for the mothers and young children. The committee have estimated that this scheme would cost £104 million,

1. Chabrol, E., Charonnat, R. and Blanchard, J., *Pr. méd.* Feb. 13, 1940, p. 177.
2. Spring, W. C. Jr., Lowell, F. C. and Finland, F. *J. clin. Invest.* January, 1940, p. 133; Finland, Spring and Lowell, *Ibid*, p. 179.
3. *Brit. J. exp. Path.* February, 1940, p. 38.

but they hold that this expenditure would be justified by the present need and would give us a valuable asset for the future. In the meantime to stem the drift back to the towns and to encourage further evacuation (which they feel should take place at once and not as the Government suggests only at the moment of danger) more use should be made of empty buildings as communal feeding-centres and hostels.

Both the A.R.P. Co-ordinating Committee and the Cambridge Education Survey, which has also submitted a memorandum to the Minister, consider that visits from parents should be encouraged. The survey also urges that responsible social workers should be available at week-ends to interview the parents, while they suggest that there should be a low flat-rate fare for all such visits. The survey stresses the need for paid and voluntary workers to share the responsibility of looking after the children with foster-parents and teachers. They suggest that reception areas should appoint workers with a general training in social service and also some with special clinical experience of nervous and difficult children. The school helpers and local voluntary visitors should work under the general direction of the trained social worker. They estimate that at least 2 per cent. of the children will be permanently unsuitable for foster-homes and should be housed in groups of 10 or 15 scattered over the reception area.

Last week two of our peripatetic correspondents admitted that evacuation had become part of our social structure. But they seemed to feel that we had yet to make a success of it. Both these memoranda have been drawn up by people who seem to feel the same and want to help.

## RADIOGRAPHY IN PLACENTA PRÆVIA

THE presence or absence of placenta prævia is not always easy to establish, and a simple way of locating the placenta without risk to patient or fœtus would often be welcome. Amniography in skilled hands will decide the position of the placenta in a fairly high percentage of cases, but this examination should not be embarked on lightly since injection of an opaque medium directly into the liquor amnii may introduce infection and may also bring on labour. Radiological examination of the relative positions of the presenting fœtal part and the urinary bladder filled with opaque fluid also has technical disadvantages and may cause irritation to the bladder wall. Brown and Dippel[1] describe a procedure by which they are able to localise the placenta in at least 85 per cent. of cases. The method consists of two separate examinations. First, a lateral radiogram of the uterus is taken, using a technique designed to demonstrate the maximum of soft-tissue detail. This film is then examined, a concentrated light being needed for viewing the anterior uterine wall. Where the placenta lies there is an increase in the thickness of the structures between the outer uterine wall and the periphery of the fœtal soft tissues. The outer uterine wall can nearly always be seen in a properly exposed radiogram and the cutaneous outline of the fœtus is represented by a thin dark line, probably due to subcutaneous fœtal fat. In this preliminary examination Brown and Dippel consider that a lateral view is sufficient since the placenta is rarely implanted other than on the anterior or posterior surface of the uterus. Even if it is implanted on the lateral walls it should be seen in the lateral view, for the average placenta covers at least a quarter of the internal uterine surface and therefore extends far enough over the anterior or posterior wall to be visualised. The common causes which hinder localisation of the placenta by this method are excessive obesity, hydramnios, the absence of the dark line outlining the fœtal soft tissue because of insufficient fœtal subcutaneous fat, and multiple pregnancy. Where the results are doubtful and in cases where there is strong clinical evidence of a low implantation of the placenta the bladder is filled with 100 to 150 c.cm. of air and anteroposterior and lateral radiograms are taken. The thickness of the soft tissue between the presenting part and the posterosuperior portion of the air-filled bladder is then measured; normally this is not more than 2 cm., whereas in a central placenta prævia it may be increased to 5 or 6 cm. With a marginal placenta the increase in thickness is found either anteriorly or laterally. Certain factors may lead to errors in diagnosis by this method, such as air or fæces in the rectum, or blood-clot in the region of the internal os resulting from premature separation of a normally implanted placenta, and some experience is necessary to interpret the findings accurately. Brown and Dippel certainly make out a good case for the more extensive use of soft-tissue radiograms in obstetrics, and their method seems to be relatively simple to perform, devoid of risk to the patient and fœtus, and according to their figures highly accurate.

1. Brown, W. H. and Dippel, A. L. *Bull. Johns Hopk. Hosp.* February, 1940, p. 90.

## MORTALITY IN 1938

IT may seem rather late in the day to discuss the incidence of mortality in 1938 as shown by the Registrar-General's returns just published.[1] But the value of his reports is not ephemeral, to be lost by a few months' delay in issue owing to war conditions, while in addition the year 1938 has the melancholy privilege of being the last for some time to present a complete and understandable picture of the national record and to allow a satisfactory assessment of gains and losses. It has often been noted that the annual death-rate is now largely determined by the rate prevailing in the first quarter of the year, because of the presence or absence of influenza; 1938 was no exception. Deaths from influenza were relatively few in number and the year's crude death-rate of 11·6 per 1000 persons living has only once (1930) been surpassed, while the standardised rate of 8·5 per 1000 sets up a new low record, a figure below 9 not having been previously observed. The infant-mortality rate likewise reached a new low point at 53 deaths per 1000 livebirths or 4 points below the previous record. This improvement was shared by illegitimate as well as legitimate babies, their relative rates being 81 and 51 per 1000. In the years of childhood, 5–15, the death-rates were as low as any previously registered; at all subsequent ages they were the lowest on record. Judged by mortality 1938 was clearly a strikingly good year. Causes materially contributing to its advantage include the low incidence of influenza, a further fall in mortality from tuberculosis, both in its respiratory and other forms, and an exceptionally low death-rate from whooping-cough. Maternal mortality also reached its lowest level with only 2·97 deaths per 1000 births (live and still) and a steady decline since 1934. On the other hand mortality from diphtheria remained relatively high, and was responsible for 2931 deaths and nearly 65,000 notified cases, acute poliomyelitis was epidemic, and the incidence of cerebrospinal fever was at a higher level than it had been for five years though its mortality showed no corre-

1. The Registrar-General's Statistical Review of England and Wales for the Year 1938. New Annual Series No. 18. Tables, Part 1. Medical. H.M. Stationery Office, 1940. 6*s*.

sponding rise. The standardised mortality-rate from cancer, for both sexes combined, has shown very little change over the last decade. In 1928 there were 1001 such deaths per million living, in 1933 997, in 1938 1005. Infant mortality continues to show its pronounced contrasts between one locality and another. For instance, in 1937 and 1938 the deaths per 1000 livebirths were 37 and 43 in Stoke Newington and 83 and 78 in Kensington, 46 and 42 in the county borough of Bristol and 92 and 99 in Wigan. Taking wider areas, stillbirths in 1938 varied between 31 per 1000 total births in Greater London, 46 in Cheshire and Lancashire and 51 in Wales.

## SUBDURAL HÆMATOMA

ATTENTION has been drawn to the importance of reaching an early diagnosis in subdural hæmatoma by Templeton in our issue of March 16 and again by Eckhoff in this issue. In this they echo Trotter, who pointed out in 1914 that the only chance of saving these patients lies in early operation. This however is difficult to achieve unless all concerned bear the diagnosis in mind in problematical cases. Trivial injury to the skull is the accepted cause of the condition but many cases give no history of trauma. After a known injury there is a latent period which according to Trotter[1] is usually about six weeks. During this time headache and a certain amount of mental impairment are present without definite physical signs. The mental disturbance may be such that the patient is liable to be transferred to a mental hospital. The prodromal period is followed by a sudden lapse into unconsciousness, usually preceded by violent headache and vomiting. Trotter says that the most characteristic feature of the coma is its spontaneous variability: "there is no other condition in which this is so clear and striking a feature." This variability is well demonstrated by Templeton's case. The assistance in diagnosis that may be given by radiography has recently been described by Bull[2] in an analysis of 26 cases studied in Olivecrona's clinic at Stockholm. Of the different techniques available in this sphere pneumo-encephalography seems of most value. By this means it is possible to recognise the type of ventricular displacement that will be produced by a structure having the characteristic shape and position of a subdural hæmatoma.

## DRUG STANDARDS IN INDIA

MAINLY as a result of the persistent efforts of a group of Indian medical men under the leadership of Dr. Chopra, the standardisation of drugs in India is in sight. All the provincial legislatures have passed resolutions empowering the central legislature to pass a measure for the control of drugs and a bill has now been introduced to regulate their importation, manufacture, distribution and sale. The word drug here applies to all substances intended to be used for "the treatment, mitigation or prevention of disease in human beings or animals, other than medicines or substances exclusively used or prepared for use in accordance with the Ayurvedic or Unani systems of medicine." The standards proposed for both imported and home-manufactured drugs are the same. Patent and proprietary medicines must conform to the formula or list of ingredients displayed on the label or the formula disclosed to the central drugs laboratory, as the case may be. For vaccines, sera, toxins, toxoids, antitoxins, antigens and the like, as well as vitamins and hormones the standards are those maintained at the Medical Research Institute, Hampstead, and such others as may be prescribed by the central (or provincial) government. Other drugs must be up to the standards specified in the latest edition of either the British Pharmacopœia, the British Pharmaceutical Codex or any other prescribed pharmacopœia, or those adopted by the permanent commission on biological standardisation of the League of Nations. Thus it is proposed to adopt for the last two groups standards which are followed in this country. In the case of proprietary medicines the bill appears at first sight to go much further than English laws and to be based rather on recent American legislation. For instance, the sale of any proprietary medicine will be unlawful unless its label displays either its formula or a list of its ingredients in a manner readily intelligible to members of the medical profession, or else the number of the certificate of registration granted by the Central Drugs Laboratory after being informed of its formula. This provision loses some of its force by an explanation in a later clause to the effect that the formula or list of ingredients shall be deemed to comply with the provision if "without disclosing a full and detailed recipe of the ingredients, it indicates correctly all the potent or poisonous substances contained therein together with an approximate statement of the composition of the medicine." This explanation seems to bring the labelling of proprietary medicines more or less into line with the practice which has grown up in this country under the pressure of the medicine stamp duty acts.

## INVESTIGATION OF CANCER CURES

FROM New York comes a very definite claim by Glover and White[1] that cancer is being cured by a specific antiserum. They claim that in 1920 it was demonstrated before members of the staff of St. Michael's Hospital, Toronto, that the inoculation of a bacterial suspension containing a micro-organism obtained from human cancer produced metastasising tumours in animals, and that this work was repeated in the hygienic laboratory of the United States Public Health Service in 1929. Their antiserum is prepared by repeated injection of horses with Berkefeld filtrates and fluid cultures of various strains of this micro-organism and the serum is used to treat patients suffering from cancer. Such claims are familiar to all who treat cancer patients because patients and their friends hear or read of them and at once beg to be treated by a method which seems to them simple and logical. The cures set out in this booklet are striking and however doubtful the doctor may feel about claims that appear in private publications and do not conform to the usual medical criteria for the presentation of statistics, it is not helpful if he tells the patient that he does not believe the facts. It can be said that many of the cases quoted have no histological proof, have really been cured by operation, or present the signs of radiation reaction with a cured cancer. Even then a residue of cases remain in which no explanation is possible and the question becomes one of truth or falsehood. There is, for instance, a record of a case of adenocarcinoma with a positive pathological report alive for 14 years with no other treatment than antiserum. Had this case been quoted in a statistical report for any of the accepted methods of treatment it would have been accepted without question. The work of the American Medical Association in investigating the claims made for secret remedies is well known, and it is probable from references to the hostile reception of their work made by the authors of this report that some such investiga-

1. Trotter, W. *Brit. J. Surg.* 1914, 2, 271.
2. Bull, J. W. D. *Proc. R. Soc. Med.* February, 1940, p. 203.

1. Treatment of Cancer in Man. By T. J. Glover, M.B. and J. E. White, M.D. New York: Murdoch Foundation. 1940.

tion has already been made. It would be of real value to the medical profession if all claims to cure the diseases which at present are regarded as inevitably fatal without special treatment and which yield only low percentages of cures could be investigated by a specially appointed body. The authority of an international committee sponsored by the League of Nations would lend great weight to such investigation, but even without this the national bodies such as the British Empire Cancer Campaign, who have already done good work on these lines, could give a useful lead.

## THE IRREPRESSIBLE *BACTERIUM TULARENSE*

TULARÆMIA, a plague-like disease of animals and man, is an infection which America is proud to call its own, for although it has been reported from countries as far away as Norway, Russia and Japan the whole history of the disease has been worked out by American observers, particularly McCoy and Francis. For our part we are content that the disease should remain American, for the ways in which *Bacterium tularense* attacks its victims are wide and varied. A natural disease of ground squirrels and wild rabbits in the western states of America, the infection may be conveyed to man from the skin or carcases of these animals, or from hares (Norway) or water-rats (Russia), or from the bites of ticks or of horse flies. Even when it is apparently safely caged in the bacteriologist's test-tube it may still escape, and there is no other organism which is so dangerous to the laboratory worker. It will pass through the intact skin of the guineapig and probably, too, of homo sapiens, and infection takes place most often through the skin of the fingers and the conjunctival mucous membrane. Polluted water had not until lately been incriminated as a possible source of infection, although the "lemming fever" of Norway, which follows the drinking of water polluted by the bodies and excreta of the small rodents called lemmings, is thought to be a form of tularæmia. Now, however, comes a report [1] from America that the water in three Montana streams has been found contaminated with *Bact. tularense*. Two of the streams are flowing creeks, while the third consists at certain times of the year of a succession of pools, and the organism was present also in the mud of one of these pools. These findings were made while studying epizoötic tularæmia in beavers, and in the neighbouring state of Wyoming these animals have provided a striking illustration of the infectiousness of tularæmia.[2] A year ago the game warden sent a dead beaver to the University of Wyoming for a post-mortem examination, and the man who unwrapped the body developed tularæmia five days later and took three months to recover from the recurring attacks of fever. At Pass Creek, from which this beaver came, a large number of beavers had died mysteriously and the trapper developed what was later proved bacteriologically to be tularæmia. It seemed likely that the beavers had died of the same disease, and there was some evidence that the infection was water-borne.

## GENTIAN VIOLET FOR THREADWORMS

NEW remedies for the cure of threadworm infections are liable to enjoy but a brief popularity since relapses are frequent, and, what is less recognised than it should be, familial infestation leads to early reinfection. Unfortunately the most efficient remedies so far suggested have involved long courses of enemas which are in many ways undesirable for children, difficult to carry out on a large scale in the family circle or in institutions, and if hexyl-resorcinol is used (certainly the most reliable rectal medicament to date) definitely expensive. For some time past the United States Public Health Service has been issuing a series of valuable studies on oxyuriasis, and the National Institute of Health anal swab for diagnosis and for checking cure has featured in many of these. Armed with this weapon Wright and Brady [1] now bring forward evidence that in gentian violet there has at last been found a relatively cheap, safe and practical method of getting rid of threadworms without the use of enemas. Four methods have been tested. In the first ½-grain "enteric-coated" tablets of gentian violet were given to adults three times a day before meals for ten consecutive days. Children received smaller doses, based on a general rule of gr. 1/6 per day for each year of apparent age, divided into three doses. In a series of 107 patients 91 per cent. gave negative swab results ten to twenty-one days after the completion of treatment. Since the life cycle of the threadworm may be as long as twenty-one days a second group of patients were given the tablets for eight days, then rested for a week and given the tablets again for eight days. Of 30 patients treated in this way 27 were negative in swab examinations made between the fourteenth and twenty-first day after the end of treatment. A third method involved similar dosage but examination was deferred until between the forty-second and the forty-eighth day after the end of treatment; here only 58 per cent. were negative. It was felt that the efficiency of gentian violet might be improved by varying the coating of the tablets so as to ensure complete disintegration. A fourth group of patients were therefore given tablets with a water-soluble coating an hour before meals for the sixteen-day course with a week's rest in the middle. Here 79 per cent. of patients were negative for threadworm ova on seven consecutive daily swabs taken from the forty-second to the forty-eighth day after the end of treatment—a rigorous test it will be agreed. Some of the positive results may have been due to reinfection in the environment from which the patients came, so that if all infested individuals in the patients' families were treated at the same time better control might be obtained. A small proportion of the patients treated suffered from nausea, vomiting, diarrhœa and abdominal pain but these complications quickly disappeared when the dosage of gentian violet was reduced or omitted for a day or two. The drug should not be used where there is concomitant infection with the round worm (which must be got rid of first), moderate to severe cardiac, hepatic or renal disease, alcoholism, or diseases of the gastro-intestinal tract. Wright and Brady conclude that gentian violet is "eminently superior to some and superior to all the other methods of therapy tested under similar conditions." Previous publications have shown that such conditions, including the use of the anal swab, are strict, so that "because of its relative cheapness, its ease of administration and its relatively high degree of efficacy" gentian violet appears to hold the field for the treatment of threadworms, especially when familial infestation is present. The sixteen-day course with a week's rest in the middle is the method of choice and tablets with a water-soluble coating should be used.

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Dr. JOHN GRAY, senior medical officer in St. Helena, has been made a member of the executive council of the island.

1. *Publ. Hlth Rep., Wash.* Feb. 9, 1940, p. 227.
2. *Science*, March 15, 1940, p. 263.

1. Wright, W. H. and Brady, F. J. *J. Amer. med. Ass.* March 9, 1940, p. 861.

# PREVENTION AND TREATMENT OF WOUND INFECTION

## III

## BACTERIOLOGY OF INFECTED WOUNDS

By ROBERT CRUICKSHANK, M.D. Aberd., D.P.H.
PATHOLOGIST TO THE L.C.C. GROUP LABORATORY, NORTH-WESTERN HOSPITAL, HAMPSTEAD

THE diminishing incidence in wars of once rampant infectious diseases together with the developments of modern warfare has brought into greater prominence the bacterial infection of wounds. It became a major problem in the last war, when gas gangrene, although known since the 16th century, emerged as a dreaded and well-defined entity, and pyogenic infection was a veritable scourge among the wounded at base hospitals. Intimate coöperation between the surgical unit and the laboratory, essential for the prevention and treatment of such bacterial infection, is probably more common now than in 1914 when difficulties in organising an efficient laboratory service, inadequate technical assistance and methods, and excess of routine work rather interfered with organised investigation. This coöperation, for which in the event of active warfare adequate laboratory facilities will be available, may be helped by a review of the bacteriological causes of wound infection, their possible sources, and the methods of specific prophylaxis and treatment.

The triad of bacterial infections which principally attack wounds are pyogenic infection, gas gangrene and tetanus, probably in that order of importance as killing and maiming diseases. Thus, the bacteriologist has to set his field to catch two groups of bacteria: (1) the pyogenic aerobes and (2) the sporing anaerobes.

### PYOGENIC INFECTION

Of the pyogenic bacteria the most important is *Streptococcus pyogenes*, with *Staphylococcus aureus* second and the coliform group together with *Bacillus proteus* and *B. pyocyaneus* third. This last group of gram-negative bacilli usually become prominent in the later stages of the infected wound, and they are to be regarded more as contaminants than pathogens although they contribute to the delayed healing of the wound. Purely saprophytic organisms include the enterococcus, white staphylococci, diphtheroids, sporing aerobes of the subtilis group, and indeterminate gram-negative cocci, all of which may be found at any stage of the infected wound.

*Strep. pyogenes* is most to be feared because of its great invasiveness, and it is most likely to invade the tissues if it gains early access to the wound before the defensive reaction has begun. At this stage it may spread beyond the wound, causing cellulitis or erysipelas or even generalised infection (septicæmia). Sometimes, if the strain is highly toxigenic and the patient susceptible, a scarlatinal rash will accompany the local infection, but this need not be regarded as an indication for removal to an isolation hospital. Infection of a wound with *Strep. pyogenes* after granulation has begun will often escape clinical observation and may only be detected bacteriologically. Such secondary infection delays healing of the wound, produces a degree of toxæmia, and may at any time extend to tissues beyond the wound, especially if and when surgical interference is required. In this connexion the affinity of the streptococcus for joints and the consequent risk of secondary septic arthritis must ever be borne in mind. It is essential, therefore, that a bacteriological examination be made of the granulating wound of any patient on whom operation is intended, and steps taken to prevent dissemination of any discovered streptococcal infection. The hæmolytic streptococci of infected wounds belong almost wholly to Lancefield group A, and so Lancefield grouping is not an essential part of the diagnostic report. Serological typing, if it is available, will give information about possible sources of infection and may perhaps, with further evidence than we now possess, give a clue to the virulence of the infecting streptococcus.

*Staph. aureus* has been the cause of much chronic invalidism from infected wounds and bones. It is less invasive than the streptococcus but it would be unwise to ignore its presence, for it may, if it does invade the tissues, set up a fulminating septicæmia, or more often a subacute pyæmia, which will require all the patient's natural resistance aided by specific and non-specific remedies to overcome it. Staphylococcal infection about the face or of bone is especially apt to cause septic thrombophlebitis with metastatic abscesses in such organs as lungs, kidneys, brain or heart. The clinician sometimes asks what is the significance of *Staph. albus* in a wound or a blood-culture. The white staphylococci are seldom pathogenic even when, as frequently happens, they produce hæmolysis on a blood-agar plate, but if there is any doubt, a simple and reliable test of pathogenicity is the power to coagulate human or rabbit plasma inoculated with a young culture of the organism and incubated at 37° C. for 3 to 6 hours.

The presence of *B. proteus* or *B. pyocyaneus* in a wound need not in themselves cause any alarm as these organisms are unlikely ever to produce a spreading or generalised infection. They may, however, as is mentioned later, play an important part in the initiation of anaerobic infections. They have also a "nuisance" value in that they may mask the presence of more pathogenic bacteria, so that the bacteriologist may have to adopt methods to inhibit their growth or spreading property. The propensity of bacteria to spread from wound to wound in a hospital ward is well exemplified by proteus and pyocyaneus, to which the surgeon can testify by the colour and smell of the discharge and the bacteriologist from his cultures.

### GAS GANGRENE

Gas gangrene in man may be caused by one or a combination of sporing anaerobes or clostridia, of which the most important are *Clostridium welchii type A*[1] (*B. perfringens*), *Cl. septique* (*Cl. œdematis maligni*, *Vibrion septique*) and *Cl. œdematiens* (*Cl. novyi*),[2] to which certain authors would add *Cl. histolyticum*. *Cl. welchii* is the most common, having been present alone or in combination in 70–80 per cent. of cases of gas gangrene in the last war, which may be compared with 10–15 per cent. for *Cl. septique* and 5–35 per cent. for *Cl. œdematiens*. However, the surgeon must know that these anaerobes are frequently isolated from wounds not affected with gas gangrene (there may be some bubbles of gas in such a wound and the brownish discharge may have a foul acrid

1. *Cl. welchii* has been divided into four types according to the serological nature of the toxin or toxins produced. Type A is the human type and gas gangrene antitoxin is prepared with the toxin of this type. Strains from patients who do not respond to specific prophylaxis or treatment might be serologically examined to find whether they belong to types B, C or D.
2. The name *Cl. novyi* has priority claims but *Cl. œdematiens* is now generally used.

odour). Thus, gas gangrene is, like diphtheria, to be diagnosed primarily on clinical evidence which the bacteriologist may or may not be able to confirm, but as in diphtheria it would be quite unjustifiable to wait for a bacteriological report in a suspected case. Nevertheless, where mono-specific antitoxins are available for treatment it is an urgent necessity to know the species of the infecting anaerobe. It is not possible to say which of these gas-gangrene anaerobes is the most virulent, for experimentally different strains of the same species differ widely in their toxigenicity and invasiveness. However, since the intense toxæmia which develops with the infection is the probable cause of death, it may be said that in general *Cl. œdematiens* is mainly toxigenic. *Cl. welchii* is more toxigenic than invasive, while *Vibrion septique* is both toxigenic and invasive. Thus the latter organism may be found in the blood of patients with well-established gas gangrene due to it, whereas invasion of the blood by *Cl. welchii* is a late or terminal event, although a temporary bacteræmia may occur about the time of operation or other manipulation. In this respect gas gangrene, essentially an infection of muscle, differs materially from the *Cl. welchii* septicæmia that sometimes develops after abortion or confinement, where early invasion of the blood and intravascular hæmolysis are outstanding features of the infection. Jaundice is as a rule seen only in the last stages of classical gas gangrene.

The bacteria causing the initial infection in gas gangrene are but poorly proteolytic, so that much of the tissue destruction and digestion that follow the gaseous infiltration and œdema is due to proteolytic commensals, and of these the most frequent and active is *Cl. sporogenes*. This sporing bacillus, which morphologically rather resembles *Vibrion septique*, is often present in wounds whether affected with gangrene or not, and is a great nuisance to the bacteriologist because of the difficulty in separating it in culture from the more pathogenic clostridia. At this point it may be asked what is the effect of coincident aerobic infection on the growth of the sporing anaerobes. Experimentally, a mixture of aerobic and anaerobic pathogens will often initiate a gangrenous infection of muscle where the anaerobe by itself may fail, and it is now believed that the growth of the aerobic bacteria lowers the oxidation-reduction potential in the tissue to a degree which will allow active germination of the spore-bearers. American observers in the last war found that a combination of gas-gangrene organisms with *Strep. pyogenes* produced a more virulent, and with *Staph. aureus* a less virulent, gangrenous infection than the anaerobes alone. But obviously other factors than an accompanying aerobic infection will provide conditions suitable for the growth of the sporing anaerobes, since gas gangrene may be well-established within a few hours of the injury.

### TETANUS

Tetanus is the second and, now that the population at risk may be actively or passively immunised against it, much the less serious of the clostridial infections. Whereas gas gangrene declares itself within the first few days and seldom after the seventh day of injury, the incubation period of tetanus varies usually between three and twenty-one days, depending probably more on the nature than the site of the lesion, and if the patient has been passively protected by tetanus antitoxin the period may be extended to a month or more. Passive immunisation also results in a proportion of cases of "local tetanus" (tetanic spasms developing among the muscles adjacent to the primary wound), which may or may not be accompanied by the classical descending tetanus; careful observation for and the early detection of local tetanus may save lives. The surgeon will also remember that tetanus may develop from small and easily overlooked wounds, particularly penetrating wounds about the extremities. Wound sepsis and especially the toxins of other clostridia facilitate infection, but whether by lowering the oxidation-reduction potential in the tissues or by preventing phagocytosis of the tetanus spores is still in dispute. As with the other pathogenic clostridia, *Cl. tetani* is not uncommonly found in the wounds of patients not affected with tetanus.

### OTHER INFECTIONS

While these are the major infections of war wounds, the doctor must always be on the outlook for other and rarer forms of infection. Wound-diphtheria, characterised as in the throat by membrane formation, may occur sporadically or in epidemic form as it did among a group of Canadian soldiers who were infected from the finger of a nurse. The virulence of any morphological *C. diphtheriæ* from wounds must always be proved. Local or generalised infection with anaerobic streptococci or fine gram-negative bacilli (*Bact. necrophorus*) which thrive on necrotic tissue was probably not uncommon in the early years of the last war before excision of wounds became a routine practice. The generalised infection begins from a septic thrombophlebitis and is manifested by daily rigors, a progressive anæmia, and embolic phenomena in the lungs, often with secondary empyema. Spreading gangrene of the skin due, according to Meleney,[3] to a micro-aerophilic streptococcus may also occur, and may require the special treatment with zinc peroxide that he recommended.

Since the treatment of wounds by packing the open wound with gauze and then enclosing the limb in plaster may, after the example of Winnett Orr and the Spanish surgeons, become popular, it is interesting to know what is the bacterial flora of such wounds. According to Trueta[4] there is a great diversity of bacteria, but principally staphylococci, streptococci and *B. pyocyaneus*. He thinks the latter organism may be antagonistic to the pyogenic cocci, and he finds that as healing progresses it becomes more prominent, while other organisms tend to disappear. Allbee found that in cases of osteomyelitis treated by the Winnett Orr technique bacteriophage to the staphylococcus frequently developed. It might be expected that proteolytic bacteria would find the wound discharges suitable for growth, and the stench is probably due to proteolytic activity. Among four cases of gunshot wounds recently treated by the closed plaster method in this country, *B. pyocyaneus* was present in one, proteolytic clostridia in one, and *Staph. aureus* in all four.

### MATERIAL FOR ISOLATION OF BACTERIA FROM WOUNDS

It is not intended to discuss here methods for the isolation and identification of pathogenic bacteria from wounds. The surgeon will doubtless make most use of the ordinary throat-swab for obtaining material, but wherever possible he should try to collect some discharge or sanious fluid in a screw-cap container which is particularly useful if the specimen has to be sent some distance to the laboratory; an adequate sample of the discharge also facilitates animal-inoculation tests, often the quickest and most reliable method for identifying the pathogenic clostridia. In gas

3. Meleney, F. L. and Johnson, B. *Surg. Gynec. Obstet.* 1937, **64**, 387.
4. Trueta, J. *Proc. R. Soc. Med.* 1939, **33**, 65.

gangrene, a piece of infected muscle or fluid from bullæ should also be sent. The specimen must be properly labelled and accompanied by a clinical diagnosis of the case, so that the bacteriologist may immediately concentrate on isolating the suspected pathogen. For primary culture the blood-agar plate incubated aerobically and anaerobically will be most generally useful, so that anaerobic jars and the means (e.g., the Hyvac pump) for rapid evacuation of the contained oxygen are essential. The replacement of the air with an inert gas is best done from a cylinder of hydrogen via a football bladder. A bacteriological diagnosis should never be expected or attempted from a stained smear of the discharge because almost every one of these pathogens has its morphological double among the saprophytic bacteria. Smears from gangrenous muscle or bulla fluid may, however, be used for an early tentative report. The bacteriologist for his part should familiarise himself with the biological characters and selective methods for early isolation of the pathogenic clostridia.

(*To be concluded*)

# SPECIAL ARTICLES

## SETTING THE DANE ON HIS FEET

### THE DANISH INVALIDITY INSURANCE COURT

THERE is much in the health services of Denmark that might with profit be incorporated in ours; and the system of invalidity insurance merits closer study in view of the rising trend of chronic incapacity. Invalidity insurance in Denmark dates from 1927. All members of an approved sick club now have to be members of invalidity insurance, and membership of a sick club is compulsory for virtually the entire population between the ages of twenty-one and sixty. At the end of 1938 about 90 per cent. of the adult population was insured against invalidity.

The resources of the invalidity insurance scheme are provided partly through premiums paid by the insured person, partly by employers and partly through state and communal subsidy. The Invalidity Insurance Court decides whether an applicant for insurance pension is entitled to receive that pension (and supplements to it), whether help towards restoring health or occupational measures can be granted to an insured person or pensioner, and whether an insured person continues to fulfil the conditions entitling him to the pension. The court consists of a chairman appointed by the crown, two medical members, two representatives of insured persons and one representative of employers with several associated expert advisers.

When the earning capacity of an applicant is found to be reduced to a third of the sum usually earned by physically and mentally sound persons with similar training, he is entitled to a pension unless the invalidity has been brought about or wilfully increased by himself or has been contracted through the abuse of alcohol or narcotics. To the basic pension rate certain supplements may be added, including one in respect of dependent children and one for the payment of an attendant, where required. All blind applicants are entitled to a supplement, and lesser degrees of amblyopia are considered on their merits.

When required by the court, insured persons and invalids, as well as children under fifteen years, must submit to training and medical attendance, including the acceptance of training in the use of surgical appliances, artificial limbs, spectacles, invalid carriages and other appliances, but no-one is obliged to undergo an operation which may involve danger to life or health. Help to start independent work and to provide working machines, as well as other help to procure employment, may also be granted by the court.

The National Insurance Act lays on every medical practitioner (in hospitals the chief physician) the duty of reporting to the Invalidity Court persons under thirty having diseases or infirmities which have reduced, or in the near future seem likely to reduce, their earning capacity to a third. Schools have a similar duty to report cases among children. At the age of sixty-five a pensioner is transferred to old-age pension and is then no longer under the supervision of the court.

During 1938 the Invalidity Court dealt with 32,000 applications and received 7000 notifications of invalid persons under thirty. About a quarter of the applicants were found by the court to be "non-invalid." At the end of 1938, 37,000 persons were in receipt of invalidity pensions, and during the year some 1500 applicants were granted a supplement for helplessness, 29 for blindness and 62 for extreme amblyopia.

### OCCUPATIONAL TRAINING

From the introduction of the scheme in 1927 to the end of 1938, 54,000 patients have benefited from "health-restoring and occupational measures." The distribution by diagnosis of the cases granted assistance during 1938 is set out in table I.

TABLE I—CASES GRANTED ASSISTANCE IN 1938

| Cause of invalidity | Medical treatment and nursing | Prostheses, bandages, and repair of same | Invalid chairs | Working machines and start help | Training | Work found by court | Total |
|---|---|---|---|---|---|---|---|
| Deformities .. | 283 | 1173 | 2 | 28 | 121 | 6 | 1613 |
| *Congenital* .. | *181* | *390* | *0* | *9* | *31* | *0* | *611* |
| Diseases of brain, spine and peripheral nerves .. | 159 | 683 | 29 | 22 | 77 | 3 | 973 |
| *Poliomyelitis* .. | *72* | *599* | *21* | *13* | *62* | *3* | *789* |
| Tuberculosis .. | 789 | 62 | 1 | 7 | 24 | 0 | 883 |
| *Pulmonary* .. | *659* | *0* | *0* | *3* | *7* | *0* | *669* |
| Amputations .. | 17 | 540 | 3 | 12 | 23 | 4 | 599 |
| Mental diseases and neuroses .. | 464 | 1 | 0 | 1 | 6 | 0 | 472 |
| Chronic intoxications and infectious diseases .. | 248 | 77 | 0 | 6 | 25 | 3 | 359 |
| Diseases of organs of special sense .. .. | 29 | 190 | 1 | 30 | 14 | 1 | 265 |
| Diseases of metabolism .. .. | 161 | 9 | 0 | 4 | 24 | 1 | 199 |
| Results of accidents .. .. | 29 | 104 | 1 | 11 | 25 | 2 | 172 |
| Diseases of digestive system .. | 55 | 52 | 0 | 1 | 1 | 0 | 109 |
| Others .. .. | 399 | 29 | 1 | 12 | 49 | 2 | 492 |
| Total .. .. | 2633 | 2920 | 37 | 134 | 389 | 22 | 6135 |

The type of training given to patients selected for it is interesting. During 1938, 219 men and 170 women received such training: 79 of the men at special schools, commercial, teachers' training colleges, chauffeur courses, technological courses, central heating courses, milk recorders' courses, &c., and 140 at various artisan trades, chiefly shoemaker, tailor,

barber, mechanic, painter, joiner, clerk, in that order of frequency. Of the 170 women who received occupational training, 41 were trained in special schools (mainly commercial), 114 were trained as seamstresses, and smaller numbers as weavers, tie-makers, clerks, hairdressers, and the like. Since 1927, 726 patients have been provided with equipment to enable them to start business on their own account, 167 as shoemakers, 190 as other artisans, 197 in domestic industries (sewing, knitting machines, looms) and the remainder in a diversity of other occupations. In most cases the help was given by way of loan.

TABLE II—EARNINGS BEFORE AND AFTER OCCUPATIONAL TRAINING

| Annual earnings before training | Number of trained persons in 1937 earning: | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0 | £1–25 | £25–50 | £50–150 | £150–300 | £300 + | Tot. |
| 0 .. .. | 14 | 100 | 121 | 250 | 23 | 3 | 511 |
| £1–25 .. .. | 1 | 5 | 11 | 17 | 0 | 0 | 34 |
| £25–50 .. .. | 0 | 8 | 1 | 19 | 5 | 0 | 33 |
| £50 + .. .. | 0 | 2 | 6 | 17 | 3 | 0 | 28 |
| No information | 1 | 8 | 11 | 24 | 1 | 0 | 45 |
| Total .. | 16 | 123 | 150 | 327 | 32 | 3 | 651 |

Up to the end of 1937, 923 patients received occupational training, about half of these being between nineteen and twenty-five. The duration of training varied widely. In 336 cases it occupied less than one year; in 295 up to two years; in 133, two to three years; in 85, three to four years; and in 74, four years and upwards. The average cost was about £75 per patient; it cost more to train artisan tradesmen than to give scholastic training. In 651 cases the occupational training was described as "utilised" and in the remainder as "non-utilised." The earnings of the former before and after training are shown in table II.

The causes of non-utilisation included death (26), health impaired (35), taken up other trade (78), married (43) and other causes (90). Of 223 patients who discontinued training the causes of discontinuance were: death (15), state of health impaired (75), lack of assiduity (30), lack of aptitude (58), taken up other trade (5), and other causes (40). The percentage failure due to lack of aptitude was higher among workers training in the more scholastic occupations and that due to impairment of health among those training in artisan trades.

Up to the end of 1937, 455 machines were granted to applicants to assist them to start work on their own account. Of these patients 370 were then still at work: 105 as shoemakers, 86 as dressmakers, 43 as brushmakers, 30 as spinners or knitters, 17 in engineering trade, 15 as watchmakers and repairers, 11 as bookbinders and 10 as basketmakers. Apart from the provision of machines, 92 patients were given help towards setting up in business: 14 as tobacconists, 8 as street newsvendors, 4 as butchers, 6 as grocers, 15 as poultry breeders, 13 as musicians, 3 as piano-tuners, 5 as mangle minders.

There is evidence in the majority of cases that employment found under the ægis of the Invalidity Court is held for a reasonably long period. As an economic factor the work of the court must have considerable significance, and as a therapeutic instrument its value must be great. The total administrative expenses of the court amounted in 1938–39 to £50,000—not a great deal to pay for new lamps for old.

## SOCIETY OF M.O.H.'s

THE annual luncheon of this society was held at the Piccadilly Hotel on April 5 with the president, Dr. F. T. H. WOOD, in the chair. After the loyal toast the President welcomed the Minister of Health, Mr. Walter Elliot, and the other distinguished guests, especially the heads of the Royal Colleges and of the Society of Apothecaries, the administrative and medical heads of the Ministry of Health, the representatives of local authorities, of their dental colleagues and of the House of Commons. He suggested a reconstruction of the speech which Sir John Simon, the first president of the society, might have made in the presence of the forerunner of Mr. Elliot, the President of the General Board of Health, eighty-four years ago. It would have been in the nature of a diplomatic and elegantly phrased regret that the functions of the board were ill-defined and resented on the rare occasions when they were exercised; and a lament that to stand and wait in the antechambers of legislation was not truly to serve, nor was it such able-bodied service as he and his colleagues were desiring to render. He might even have ventured to repeat an observation he had made, as M.O.H. for the City of London, to the effect that the difficulties which had baffled successive Home Secretaries might soon find their solution in the less divided attention which a Minister of Health might bring to their study. The country now had a Minister of Health with extensive and well-defined functions, the exercise of which the President could say—not being on oath—were always welcomed by local authorities. There was still much "waiting in the antechambers of legislation," but in those chambers municipal medical officers were given opportunities of shaping and—who knows?—of improving the statutes and regulations on public health which still came out in a steady spate. He paid tribute to Mr. Elliot's personal qualities and greeted him as a fellow-member of the medical profession.

Mr. ELLIOT, in reply, observed that the luncheon was noteworthy as a step towards the restoration of ordinary activities. He, like the medical officers, suffered from too much reading of regulations, and was glad of the opportunity to join again in an assembly of the brethren. The 1500 local authorities and their medical and administrative staffs are, he said, greatly indebted to the work of the medical practitioners. As an honorary Englishman he did his best to imitate the qualities of the great and distinguished English race, and particularly its power of working with others, its kindliness and tolerance, all of which were now more necessary than ever before. The administrative and practising sides of medicine were much more closely interwoven now than they had been a year ago. The diversion of so much energy from the tasks of peace to those of war was in one way a tragedy, but in the sphere of national health tremendous advances could be dated from the end of the last war. The vital statistics of this year were vastly better than those of 1918. The outpatient rate had been reduced by half, the general death-rate had fallen, the infantile mortality had dropped from 89 to 53. What had been done once could be done again, and the end of this war might see another similar advance. Evacuation and the emergency medical service had thrown gigantic and immediate tasks upon the shoulders of many of those present. He and his colleagues in Whitehall were by no means ignorant or unmindful of those tasks. The success of the evacuation, carried through without injury to the public health, had been built on the achievement of medical

officers of health in years past. The fact that infectious diseases had not increased, but even in some places had diminished, was a striking tribute to the solid work which had gone into the public-health services during recent years. In 1837 Sir John Simon would have had to deplore an expectation of life in Manchester of only 20 years and in Liverpool of only 17 years—very different from the figures of today: 59 years for a boy and 63 for a girl. A great hospital building programme was actively under way for providing 40,000 beds, nearly all under the supervision of local authority medical officers. The war effort of the medical officers of health was no less important than that of the men of the fighting services.

## MEDICINE AND THE LAW

### Cancer Act Prosecution

ALTHOUGH the legislature has neglected opportunities to forbid the advertisement of cures for various diseases for which no cure is at present known, a clause was inserted in the Cancer Act last year to make illegal the advertising of a cure for cancer. Last week the Bath magistrates dealt with one of the first prosecutions under the clause. A herbalist displayed in a shop window a board bearing the words "Cancer Cure—£100 to Leeds Hospital if I fail to cure cancer —Wright, herbalist." The medical officer of health drew the attention of the police to the advertisement and a summons was issued. The herbalist told the magistrates that he was guilty of treating cancer; he had, he said, brought a case to the court. He claimed to have cured cancer where hospitals had failed. It was explained to him that he was not charged with treating cancer but with advertising a cure. In answer to the magistrates he undertook not to repeat his offence. The police having reported that there were no previous convictions against the defendant, he was bound over for a year in the sum of £5 and was ordered to pay 4*s*. costs. "We think you did not know about the statute," said the chairman of the bench; "we did not know about it ourselves, but there it is; people are supposed to know these things."

There is a legal maxim that ignorance of the law is no excuse. A few years ago a flustered defendant offered a metropolitan magistrate a revised version of the maxim—"Of course," he said, "I know that ignorance is no excuse for the law." There will be no excuse in future either for the herbalist or for the Bath magistrates. If there are many such cases, the legislature can feel amply justified in having inserted the statutory prohibition in the Cancer Act last year.

## SCOTLAND

(FROM OUR OWN CORRESPONDENT)

#### ABERDEEN GRADUATION

Lord Meston, chancellor of the University of Aberdeen, in his address to new graduates at the spring graduation ceremony said that it is inconceivable that the nations will again allow the progress of man to be exposed to the sabotage from which it has suffered in recent years. In the measures to be taken our country will almost certainly have to take the lead. The responsibility will fall on those of the new graduates' generation who have brains and are not afraid to use them. He felt an evergrowing impatience and resentment that those who cannot serve as combatants are not being used to support the actual fighting forces. Perhaps one day a Government department will begin to realise what a volume of human power is running to waste in this country in a way which would be impossible in Germany or indeed in France. Then it may be able to tell the university and all its members what it and they could be doing to help in the struggle. Lord Meston asked whether his hearers would prefer to be idealists with Thomas More or realists with Nicolas Machiavelli. If Europe had followed More rather than Machiavelli what a different world we should find ourselves in today.

#### CANCER RESEARCH IN EDINBURGH

The cancer-control organisation for Edinburgh and the south-east of Scotland has decided to renew grants for research work at present being conducted in the university, the Royal College of Physicians laboratory and the Royal Infirmary amounting to over £1000 in the present year. The committee also voted £250 to the Royal Infirmary towards the cost of a new tube for deep X-ray therapy. It was felt that there should be no remission in the scientific investigation and treatment of cancer even during the years of war. Research must continue on a wide scale and the fullest range of modern methods of treatment must be available wherever possible. It was decided not to make any general request for financial support during the war in order to avoid clashing with what were perhaps more urgent appeals, but the committee hopes that there will be no falling off in contributions and legacies.

#### WOODEND HOSPITAL, ABERDEEN

Under the Emergency Hospital Scheme an annexe containing some 200 beds is to be erected at Woodend Hospital, Aberdeen, by the Office of Works. A sixty-cubicle ward at present being used by nurses might be utilised, when the new nurses' home is finished, for the nursing staff of the annexe. The domestic staff of Woodend live out, so there will be no need to construct any new buildings to house them. Meals for the annexe will be cooked in the kitchens of the parent hospital.

## UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENT)

#### U.S. VERSUS A.M.A.

THE suit of the government against the American Medical Association charging that their efforts to discourage the Group Health Association of Washington D.C. constitute a violation of the Sherman anti-trust act has been carried one stage further. The district court had held that medicine is a "learned profession" not within the scope of the act under whose provisions the suit was instituted. This ruling was reversed on March 4 by the Court of Appeals which has held that "it cannot be admitted that the medical profession may through its great medical societies, either by rule or disciplinary proceedings, legally effectuate restraints as far reaching as those now charged." This decision does not establish the guilt of the A.M.A. but merely the propriety of the suit under the anti-trust act. The case will now be retried in the lower court unless in the meantime the attorneys of the association decide to carry an appeal against the latest decision to the supreme court.

#### QUARTERLY JOURNAL ABOUT ALCOHOL

The Research Council on Problems of Alcohol is to publish a *Quarterly Journal of Studies on Alcohol*. This will be edited by Dr. Howard W. Haggard, assisted by a distinguished editorial board. Manuscripts may be submitted to the editor at 4, Hillhouse Avenue, New Haven, Connecticut, U.S.A. The first issue is to appear in May and will include original

scientific papers reporting experimental, clinical and sociological investigations and reviews; editorials; abstracts of current literature; medicolegal cases; and reports on the activities of the council.

### AMYOTROPHIC LATERAL SCLEROSIS TREATED WITH VITAMIN E

On March 12 a paper was read by Dr. I. S. Wechsler of the Mount Sinai Hospital to a joint meeting of the New York Neurological Society and the section of neurology and psychiatry of the New York Academy of Medicine on the treatment of amyotrophic lateral sclerosis with tocopherol (vitamin E). Since October of last year eight cases have been under treatment. In three advanced cases no improvement was observed, in three there has been some improvement and the other two have been remarkably improved. One bedridden patient, with commencing paralysis of the tongue and dysphagia, is able after three months' treatment to move about the house with assistance. Another patient who three months ago suffered from paralysis and atrophy of the muscles of one hand is now able to use the hand for skilled movements. The rationale of tocopherol treatment is based on observations made by Evans and more recently by Einarsen and Ringsted of the pathology of the nervous systems of animals that have been deprived of this vitamin.

# PUBLIC HEALTH

## Points from Annual Reports

Dr. A. Hamilton-Wood, of *Warwickshire*, mainly a rural county in area (477,186 out of 558,710 acres), but urban in population (257,880 out of 397,600) gives the corrected death-rate for 1938 as 10·17. Of the total deaths 25 per cent. were due to heart disease and 13 per cent. to cancer. There was a slight increase in deaths from tuberculosis to 188, giving a rate of 0·47 against 0·41 in 1937.

At Rugby there is a gynæcological clinic at which advice on contraception is given. Dr. Jean Watson, who was medical officer of the clinic, reporting on the year's work, says that the main difficulty is to get the women to report regularly. This is due partly to distance, but partly to subnormal intelligence. "Return visits have been made mostly by patients of average intelligence" and "Both subnormal intelligence and poor environment are serious obstacles to the successful use of the method." Contraception fails socially because that section of the community for which it might be valuable is unable or unwilling to use it.

*Staffordshire* is another mixed rural and urban county tending towards urbanisation. In 1931 the total population was 703,254 of which 212,622 was rural; in 1938 the total population had risen to 749,900, but the rural population had fallen to 180,700. Dr. W. D. Carruthers says that the decrease in the rural population is explained by changes in sanitary districts brought about by the Staffordshire Review Order, 1934. The issue of the order was, however, itself due to the growing urbanisation of the county. The report contains some interesting information on the working of midwives. In 1915 there were in the county 320 midwives, of whom only 129 were trained, who attended 11,325 confinements and called in doctors for 1209 or 12·7 per cent. In 1938 there were only 201 midwives, all trained, who attended 8570 confinements and called in doctors for 4283 or 50 per cent. The fees paid to doctors rose from £1100 in 1925–26 to £3513 in 1937–38 and the amounts recovered from the patients rose from £366 to £1593 in the same period. The results judged by the only measure available—the death-rates of mothers and babies—show little or no change. It would be improper to conclude that the midwifery service has grown in complexity and expense without any compensating return, for the real test of efficient midwifery is the postnatal condition of the mothers, of which we have no information.

Cerebrospinal fever gave 33 notifications and 15 deaths. This is an average fatality for the days before the sulphonamide compounds were used. It will be interesting to see how this record for 1938 compares with that of 1940.

The corrected death-rate of Staffordshire in 1938 was 11·2. In many reports from 1938 we have noticed the use of the expression "standardised death-rate" when "comparable death-rate" is meant. The standardised death-rate is the crude death-rate (corrected for transfers) reduced to what it would be on the population of the standard year 1901. For England and Wales the standard death-rates for the three years 1935–37 were 9·0 9·2, 9·3. The comparable death-rate is the crude death-rate (corrected for transfers) multiplied by a comparability factor to enable the rates of different districts to be compared for the current year. The comparability factors in use were cast in 1931 and call for revision.

The city of *Wakefield*, one of the last towns to be granted county-borough powers, suffered severely from the industrial revolution. Dr. Thomas Gibson, formerly medical officer of health, in his valedictory report, gave a detailed history of the public health of the city since the early days of the nineteenth century which reveals that until recently Wakefield was an exceptionally filthy town. Needless to say conditions have improved out of recognition, but it still suffers from severe atmospheric pollution, partly through its own fault but more from the misfortune of its position. In 1927 the monthly average soot deposit in the cleanest part of the town was 21·66 tons per square mile. In 1934 it sank to 7·61 tons, but it has risen since and in 1938 it was 9·25 tons. In 1938 in the centre of the town (Northgate Station) the deposit varied between 18 and 30 tons per month. There has been a satisfactory reduction in the number and wickedness of black-smoke offenders, but there are still some. In 1938 the second worst offender was the West Riding Mental Hospital. Dr. Frank Allardice, the present medical officer of health, reports that in 1938 the infantile mortality was 60, of which the neonatal mortality accounts for 43. Amongst male infants the rate was 77, amongst females 39. The daily consumption of milk per head was 0·46 pint. The percentage of infants born in 1937 who were wholly breast-fed for six months or longer was 70·43. The Wakefield Corporation Act which came into operation in June, 1938, has some interesting features, three of which are of great importance to the practice of medicine. They are, first, the requirement of parents to notify certain diseases of school-children; secondly, the power to remove infirm and diseased persons neglected or in insanitary premises, and thirdly, the power of the medical officer of health, upon obtaining a warrant, to enter premises and examine persons if he has reasonable cause to believe there is or has been a person therein suffering from a notifiable disease.

Dr. Ian McCracken was promoted medical officer of health to the county of *Durham* in October, 1938, so the report for that year deals mainly with events during the tenure of office of the late Dr. J. McIntyre. Durham contains 623,260 acres of which rather less than a quarter is in boroughs and urban districts. Of its total population of 884,000 the rural districts contain 270,000. For its size, Durham contains more distressed areas than any other English county, yet its health record is by no means unfavourable, the death-rate in 1938 being 11·7 against the England and Wales rate of 11·6. The infantile mortality-rate was 61, the lowest ever recorded in the county. Of the 10,239 deaths in 1938 suicides account for 73 and other accidents for 369, of which only 73 were of females. May had the highest number of suicides with 12, August the lowest with 2 and January and November 3 each. Of the deaths from accidents, 89 occurred in coal mining, the highest number (18) in Easington. Deaths from motor vehicles numbered 81 males and 16 females. The incidence of tuberculosis in the county is estimated at 4·9 per 1000 population. Pulmonary (2238) and non-pulmonary cases (2120) are nearly equally frequent.

Dr. G. Matthew Fyfe succeeded Dr. G. Pratt Yule, to whom he had been deputy for some years, as county medical officer of *Fife* in July, 1928. His first annual report, therefore, deals with matters for which he was not responsible, but with which he was familiar. The chief interest in the report lies in the table of maternal mortality. The Scottish rate for 1938 was 4·9, the Fife county rate 3·8. The rate for Fife was 7·4 in 1930 and in 1935, but since then the decline has been regular: 7·4, 6·2, 4·4, 3·8. Most remarkable is the fall in the rural landward area from 9·1 in 1930 to 1·7 in 1938. The rate in the small burghs varied from 9·0 in 1935 to 3·1 in 1937, but shows no definite trend. Of the 3469 births in the county in 1938 only 944 were attended by midwives, but arrangements were made in 2137 for a doctor to be in attendance at the confinement. The Scottish Maternity Act of 1927 requires the local authorities to make arrangements for the supply of midwives and doctors, for Scottish midwifery practice has always been in the hands of doctors and the English system which culminated in the Midwives Act 1936 does not apply north of the border.

Dr. A. Massey produced his 1939 school report for the city of *Coventry* in February, 1940, and was the first medical officer of an evacuated area to give his version of the alleged shortcomings of evacuated children. Shortly after evacuation an inspection was carried out of the Coventry pilgrims by the school medical and nursing staff. Varying degrees of uncleanliness were found in 10·3 per cent. against the usual finding of 9 per cent., a normal deterioration at the end of the summer holidays. Of the 12,400 school-children in the evacuable part of Coventry the parents of 5555 expressed their willingness for the children to go; 3119 were actually evacuated, but only 1387 remained in the reception area at the end of 1939. Teams from the staff of the Coventry school medical department were sent into the reception area to supervise the children and make arrangements for their medical and dental supervision. The cases of uncleanliness were "radically dealt with," satisfactory arrangements made with the reception authorities and the teams returned to Coventry, the receiving authorities being able to carry on without them. All schools in Coventry were closed for five weeks at the outbreak of war but after that the school medical department rapidly got back to normal working and by the end of the year had settled down to war-time routine. The Coventry evacuation was simple compared with that of London, but the way it was carried out was commendable, especially for the expedition with which the Coventry authorities looked after the settlement of their children in the reception area. Since Coventry had always admitted an average amount of uncleanliness in the city children, the reception areas could have no cause to complain, for the children they received tallied with expectation.

## Infectious Disease in England and Wales

DURING THE WEEK ENDED MARCH 23, 1940

*Notifications.*—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 770; whooping-cough, 449; diphtheria, 678; enteric fever, 29; measles (excluding rubella), 4111; pneumonia (primary or influenzal), 1296; puerperal pyrexia, 170; cerebrospinal fever, 475; poliomyelitis, 4; polio-encephalitis, 1; encephalitis lethargica, 4; dysentery, 28; ophthalmia neonatorum, 83. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on March 22 was 1184 made up of: scarlet fever, 117; diphtheria, 182; measles, 5; whooping-cough, 46; enteritis, 59; chicken-pox, 52; erysipelas, 36; mumps, 5; poliomyelitis, 3; dysentery, 7; cerebrospinal fever, 119; puerperal sepsis, 14; enteric fevers, 7; german measles, 313; other diseases (non-infectious), 62; not yet diagnosed, 157.

*Deaths.*—In 126 great towns, including London, there was no death from smallpox, 2 (1) from enteric fever, 2 (0) from scarlet fever, 7 (0) from measles, 7 (0) from whooping-cough, 20 (1) from diphtheria, 35 (2) from diarrhœa and enteritis under 2 years, and 221 (16) from influenza. The figures in parentheses are those for London itself.

Sheffield reported 13 deaths from influenza, Liverpool 12, Manchester 10, Birmingham 8, no other great town more than 6. The second fatal case of typhoid was at Keighley. There were 8 deaths from diarrhœa at Birmingham and 4 at Liverpool. In the same week Glasgow reported 7 deaths from cerebrospinal fever and London 6.

## The Lancet 100 Years Ago

*April* 11, 1840, *p.* 93.

*From a report of a paper read to the British Association for the Advancement of Science by Dr. R. D. Thomson.*

The object of the paper was to discuss the experiments from which the deduction had been drawn by Prout, Tiedemann, and Gmelin, that free muriatic acid exists in the stomach. The author had made varied experiments in order to ascertain whether any acid could be distilled over from the filtered fluid contents both of the human stomach and of the inferior animals; and although he has generally procured traces of acetic acid, he could never detect the slightest indication of the muriatic. This result is in consonance with that of Schultz, who denies that there is any acid in the stomach, save the lactic, and this he admits he has met with in a free state, almost constantly, in the course of a very extended experience. The method adopted by Prout and others to determine whether free muriatic acid was contained in the stomach was to filter the contents of that viscus, to take a certain weight of the fluid, and to precipitate it with nitrate of silver. An equal quantity was taken, evaporated, and ignited; the residue was then dissolved in distilled water, and the solution precipitated with nitrate of silver. The difference between the weights of chlorine in the two silver precipitates was taken as the indication of the total amount of free chlorine or muriatic acid contained in the stomach. Now, according to Dr. Thomson, this experiment is liable to, at least, one objection; he has ascertained that common salt is decomposed to a considerable extent by various vegetable substances, when they are ignited in contact with each other; and hence the saline matters of the stomach may lose muriatic acid without there being any of this acid in a free state in the stomach.

# IN ENGLAND NOW

*A running commentary from our Peripatetic Correspondents*

My first impression on emerging from retirement to be a M.O.H. again was that apart from the number of people in uniform things are going on much as usual; but a little practical experience shows striking alterations. This is a county with a lot of troops in training and various other war activities and receiving a large number of evacuees. One noticeable change is the transference of health officials from their normal duties to work especially associated with the war. The M.O.H.'s are kept busy with duties as clinical officers in the A.R.P. scheme and with responsibilities for the organisation and efficient functioning of A.R.P. Those useful men the sanitary inspectors have been roped in for all sorts of war duties. Most of them are billeting officers for their districts and this is absorbing much of their energies. This involves them in all sorts of duties from helping their committees to find suitable "sick bays" and the arrangement of emergency medical treatment to the solution of the ever-pressing problem of finding boots and clothing for evacuee children whose parents harbour the view that what they originally provided was immortal. When rationing officers are needed again many inspectors are utilised, while all of them are concerned with A.R.P. as decontamination officers and the like. While therefore most medical and sanitary officers are retained in the county there is a considerable deviation of function and a concentration of mind and practice on the problems of war as distinct from health.

The war has created a number of new problems. The first and most urgent was due to the heavy introduction of evacuees, official and unofficial. The official evacuee school-children added 50 per cent. to the normal elementary-school population, this apart from over 2000 unofficial evacuee children. The thousands of nursing and expectant mothers created many difficulties and emergency maternity beds had to be improvised in large numbers. Most of these women and children have now returned, but about three-quarters of the children still remain. The degree to which they were verminous varied greatly in the different parts of the county but a good many were. The health visitors, district nurses and volunteers did a splendid job and most of the trouble is now eliminated. Scabies has also been a problem and most of the cases had to go to isolation hospitals or any other place we could utilise in the emergency. It is neither reasonable nor practicable to expect a woman who has been kind enough to take three London children also to work to clear them of scabies, so institutional treatment was inevitable. The same point arises with other conditions such as impetigo and this accounts for the need for sick bays to deal with such cases. These have been mostly converted houses.

An interesting point about the evacuees is that when a comparison was made between their medical condition and those of the native children they showed rather higher malnutrition figures (17 to 12 per cent.) but much less nose and throat abnormalities (8 to 28 per cent.) and less physical deformities. The nose and throat differences are probably largely due to the fact that the county figures were for the whole year while the evacuee figures were examinations mostly made (by the same medical men) in a dry autumn. It was mainly a matter of less chronic tonsillitis or enlarged tonsils. Obviously with a 50 per cent. increase in the county school staff additional medical officers, school dentists and dental attendants have had to be provided, for the guiding principle of the county education authority is to give their little visitors exactly the same health facilities as are enjoyed by the native children. It has all been done and things are working well. Most of the children I have come across thoroughly enjoy this country life.

An unfortunate effect of the war effort, to which not enough attention has been paid, is that the military and A.R.P. bodies with single-hearted attention to their own needs requisitioned entirely or in large part all the buildings like clinics, public halls, village halls and the like for their own purposes. This means that now, when it is so important that efforts should be made to keep our own people and our importations in good heart and help them by educational efforts, the premises we need are either not available or so mutilated that they are of limited value. War effort involves mind as well as material and crude materialism has tipped the scales too far on the one side.

Of other new problems one of considerable importance is the provision of beds for infectious diseases. The military hope to use the civilian beds and have been able to do so to a large extent. This was only possible by a considerable extension in the autumn of emergency beds. This county was well provided and a further 80–90 beds was found to be adequate for the extra responsibilities. Cerebrospinal fever gave us some anxiety but 21 cases a week was the highest reached and it now seems well on the decline in the county. This number of cases could easily be accommodated in our isolation hospitals, for all these are linked together in one scheme and cases can go anywhere if necessary. Venereal disease is also a war problem but the county is so well supplied with clinics that no additional provision has been needed. Actually I do not think there has been any material increase in venereal disease.

* * *

To the uninitiated the life of a laboratory worker may seem sedentary and stay-at-home; actually it often involves a lot of travelling and today, if one is lucky, travelling means flying. He who flies soon makes the acquaintance of "La Marignane," not as might be supposed a rival to Mistinguette but the airport of Marseilles. In my youth, before the days of motor-cars, almost everyone had a favourite railway junction where all trains stopped and one changed trains; usually one waited at Clapham Junction, Bletchley or Newton Abbot. Today La Marignane has replaced them all, but as a junction for the world. Nevertheless, La Marignane retains many of the features of the old-time junctions. Though the Provençal sun beats down upon an arid plain and on the choppy waves of the lake where the seaplanes land, it is usually cold and a biting wind blows round unexpected quarters. The restaurant provides one of the world's worst lunches, while the lavatories, though clean and marble-tiled, are void of that essential article, toilet paper. Those who know bring their own. But to make up for these deficiencies the waiting-room is fascinating. On a large map La Marignane is shown as the centre whence radiate out planes to all parts of the world, while large time-tables show you the hours at which they leave for Sydney or Shanghai, Cape Town or Corfu.

My last visit to La Marignane was a somewhat lengthy one. Owing to what the French term *agitation* in the air in the neighbourhood of Sardinia

we were an hour and a half late and the plane had left for Paris; it didn't matter for there was another at half-past two. If one fancied it there was a free lunch, and there were the addresses to read on the parcels which forever litter the promenade. "Urgently wanted in Hanoi" read one label; "Fragile for Malakal" another. What could they possibly contain? Half-past two but no-one has made a move towards our plane, which is sitting smugly on the asphalt. Ah! the *correspondance*; the plane from Dakar is late.

At half-past four the *correspondance* duly arrives and the usual crowd of somewhat bedraggled passengers emerges. How different from the immaculate men and women who, in the advertisements, are seen descending from aeroplanes! The routine of tickets and douane is gone through, and finally, just after five, all the passengers for Paris are duly embarked in the plane and the doors are closed. The motors start to rev., though even to my inexpert ear they don't seem to be doing too well. However, we taxi off and from the farthest corner of the bumpy field we begin that final rush which should give us the impetus to soar off into the air. But alas, there is no increase in the motors' revolutions, they suddenly stop, and after rising a few feet from the ground the plane, with a final bang, comes to earth again with a jar. No-one is hurt. The mechanic gets out, the two pilots get out, and finally we passengers get out and all gaze fixedly at the engines. "Eh bien!" says the senior pilot, "il faut coucher ce soir à Marseilles"; and then to console us, "Anyhow, it's raining in Paris and there's a nasty head-wind." And so off to Marseilles in the blue autobus. Seven o'clock next morning sees us in the same bus again on our way to La Marignane. There are only five passengers. The anæmic infant from Dakar, recognising me as a friend from yesterday, insists on calling me "Papa." His "Maman," who is shortly to add to the family, is dressed in deepest mourning, but she looks quite cheerful so probably it is only for her husband's uncle's wife.

This time we are really off. The small boy from Dakar starts to cry and is being given greenish-coloured bonbons. We fly off over the Camargue. There below us is the winding Rhône. That over there must be Beaucaire and Tarascon—shades of Tartarin and of Aucassin and Nicolette—and that is certainly Avignon, one can just recognise the broken bridge. The small boy is being sick and Maman has not been quick enough with the brown paper bag so thoughtfully provided. I change my seat. We are rising now above the clouds which cover the central massif of France, twelve, thirteen, fourteen thousand feet. The small boy and Maman have both gone to sleep so there is no likelihood of any immediate emergency in that direction. I feel sleepy myself. I must have slept for more than an hour. We are lower now and its a bit bumpy. Through openings in the clouds one can see a straight white road, an occasional patch of water. Red roofs appear, we are well below the clouds now. Its the outskirts of Paris at last, and in a few minutes we are taxiing up to the black buildings of Le Bourget. There's G; I can hand over my mice to him at last. Soon we are rattling over the Paris pavé in G's ancient but historic car, for this was the motor in which Charles Nicolle drove in the last years of his life in Tunis.

# PARLIAMENT

## ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

THE proceedings of the House opened after Easter with the Prime Minister's statement on the tightening up of the blockade. This week the screw has turned and the momentous announcement of the laying of mines in Norwegian territorial waters to stop the German protected route to Narvik for iron ore has been made. It is clear that neutrality in this war has to be redefined. And in respect of the main issue between the Allies and Germany it is doubtful if real neutrality can exist.

These great events do not dwarf the importance of Parliamentary debates but they set the scene for those debates. Last week the debate on agricultural wages was not a wrangle about a shilling or two one way or the other on wages, but a debate on the best means of getting production from the land in the national emergency. The Minister of Agriculture laid it down that agricultural wages must rise and that the gap between agricultural wages and wages in other occupations must be substantially lessened. "If we are to intensify our food-production campaign," said the Minister, "a fair and proper reward" must go to both employer and employed. Minimum wages in the bill presented "are to be looked at . . . from the broad national view." Many farmers would like to link the rates of agricultural wages with prices of agricultural products, but that is hardly practical politics.

Mr. Lloyd George spoke in the debate for fifty minutes and said that he agreed with Sir John Orr "that during the war we ought to deal, in one comprehensive stroke, with the whole question of keeping down food prices and that the state should give a big comprehensive subsidy for all vital foods." Another member, Brigadier-General Brown, also quoted Sir John Orr's views at length and suggested that Government and Opposition should "get in touch" and "arrange a policy extending over five or six years to deal with this matter." Mr. Roberts calculated that on the basis of the rise of agricultural prices which has occurred since war began the farmers were receiving an increased amount of about fifty million pounds a year. If the agricultural worker got a rise of 5*s*. a week this would cost the farmers five million pounds a year, or 10 per cent. of the increased prices. It was of course true that the farmer had to pay increased prices for feeding stuffs, but this was more than offset by the increased prices he received.

* * *

More and more interest is being taken in the agricultural situation for the simple reason that we are more and more having to live off our own land and because also members of all parties are impressed with the importance of nutrition as a factor in national defence. In the food-prices debate on the opening day of Parliament Mr. L. S. Amery also quoted Sir John Orr as saying that 10 per cent. of the wage-earners of the country and 20 to 25 per cent. of the children are undernourished. He went on to say that every investigation tends to show that the main problem of poverty is the family. The last investigation carried out in Bristol, fully reported in the current number of the *Economic Journal*, showed that in Bristol, a fairly well-to-do city, 80 per cent. of the poverty occurs when there are three or more children in the family. This problem ought to be faced "as an

urgent human need and as an urgent problem of the war." Dr. Summerskill, who spoke immediately after Mr. Amery, wholeheartedly endorsed his sentiments and said that she considered there had been a rapid deterioration in the standard of living. The question of the supply of vitamin A for margarine was also raised. Dr. Summerskill was very definite about onions, which she said had no value at all, a remark which obviously seriously disturbed numbers of members on the Opposition and Government benches. Whether a food like onions or shallots could spread over Europe and Africa and be used century after century if it had no food value at all seems doubtful. Even if its value is that of an appetiser only its value is not negligible. Possibly by the time the alphabet of vitamins becomes more extended someone may discover an essential accessory food in the onion. But one wonders if vitamins and minerals added to the carbohydrates, fats and proteins of diet cover everything. Do we really know all about the food values even of the commonest food substances? Perhaps we do. But the experts used to mock at the housewife's preference for yellow butter—until another expert discovered vitamins. Another matter much present in members' minds is the experience of world epidemic diseases at the end of the last war and their relation to privations and especially to food deficiencies.

* * *

Another bill considered was that to repay £37,000,000 of the debt on the Unemployment Insurance Fund. The Opposition thought this was too much and proposed to use some of this money in shortening the waiting period for unemployment benefit, increasing benefits to bring them into line with the increased cost of living and other payments to remove anomalies applying to married women. "If unemployment benefit scales," asked Mr. John Griffiths, "were inadequate before the war, how much more are they inadequate now?" The bill incorporates a proposal to increase the benefit for the first two children of an unemployed man—but for the first two children only. Mr. Griffiths argued that all children should have the increase and said that the difference in cost between the Government and the Labour Party proposals would be £250,000. But the Minister of Labour resisted this. Mr. Griffiths had also been reading Sir John Orr's book and quoted this sentence: "Victory will depend as much on the morale and powers of endurance of the civilian population as on the efficiency of the fighting forces. Morale and powers of endurance cannot be maintained unless the whole population is on a diet good enough to maintain it in health." The House of Commons is very much nutrition conscious, and the subject is recognised as of equal importance with that of civil defence or the fighting services. The Minister of Labour defended his position with his accustomed debating skill and said that the time might be coming when jobs would be seeking men and not men jobs. Unfortunately this does not mean that nutrition standards will be adequate in all cases as witness the experiences of Russia and Germany. Before long therefore we are likely to have more far-reaching proposals with regard to nutrition brought before us. The new Minister of Food is first and foremost a great shopkeeper and he knows the advantages of economical dealing with large quantities. It would not be surprising therefore if he produced some new ideas; he was well known for that in his business. And as he might say, new ideas sell goods. So perhaps the new Minister will, in the American sense "sell" nutrition to his colleagues.

## FROM THE PRESS GALLERY

### Food Prices

In the House of Commons on April 2 Mr. W. S. Morrison said that the prices of controlled foodstuffs were to be reviewed in the light of an elaborate costing inquiry now being made into the cost of distribution. The Government had tried in fixing prices to arrange that cheap and plentiful supplies were left for the poorer people. Recently, on account of the increase in the price of materials, they had had to advance the price of margarine by 1*d.* a pound, but that advance was restricted to the two dearer varieties, and the price of the 5*d.* variety was left where it was. In addition all the 5*d.* margarine was now vitaminised, an advantage which previously was possessed only by the more expensive brands.

Dr. Edith Summerskill said that there had been a rapid deterioration in the standard of living. She had observed in her work and by looking at the tables of the people in the country that an undue proportion of sausages, condensed milk and margarine was being eaten. In houses which she visited before the war there was always fresh milk, but since the war she had seen tins of condensed milk. She wanted to know what factors determined the controlled prices. She found on inquiry at her grocer's shop that among the controlled foods the only foods which a wise woman could buy as a substitute for meat were tinned salmon, sausage and imported eggs. It was no use saying, "I will fill the children up with bread and batter pudding." All that meant was that at the end of the war the physique of the children would have deteriorated. Why had not the problem of food-supply been approached in an entirely different way, and why had not someone with a knowledge of food values been consulted? Such a person would have said that in subsidising the food of the country they must subsidise those substitutes which the people would buy. The people were being given what might be described as an *ersatz* diet, coloured and made up. They were told by the Government that it was good and cheap, but it had no food value. Unless the Ministry of Food reviewed the whole situation they would find that after the war they would have an *ersatz* population.

Mr. Lennox-Boyd, parliamentary secretary to the Ministry of Food, said that there was nothing in the recently announced milk policy to prevent an extension of cheap milk schemes to those who really needed them. The question of condensed milk and its retail price was still under consideration. When the campaign which the Minister of Food was inaugurating that week was fully launched, it would show that the Government were fully alive to the need of teaching people to eat the right food and the need of seeing that they could get it at prices which they could afford to pay.

In a debate on agricultural policy on April 3 Mr. Lloyd George called attention to a pamphlet issued by Sir John Orr. The Government had to decide not merely the quantities of foods which they were going to produce but which were the most important things to produce, so that if anything had to be done without it would be only those things which were not essential to the vitality of the human frame. Sir John Orr pointed out that if they were going to put burdens on the farmer which he could not bear he would not carry them, and he urged that during the war the Government ought to deal in one comprehensive stroke with the whole question of keeping down food prices, and the state should give a big comprehensive subsidy for all vital foods. As Mr. Amery had said, it was the family that reduced the standard of living in cases where the wage was not adequate to cover the whole business. The advantage of Sir John Orr's proposal was that it met that case. The more the consumption was the more beneficent would be the spending of the subsidy, because it covered the produce and not the individual. They were not subsidising wages by such a plan; they were subsidising

the standard of living and preventing the war from driving wages up to a height which would in the end increase the cost of living again. He asked the Government to bring forward a great, broad, comprehensive scheme for seeing that the nation was fed, however long it might have to fight. (Cheers.)

Sir REGINALD DORMAN-SMITH, Minister of Agriculture, replying to the debate, said that his department had been trying to lay their plans in the light of the experience which they had gained this winter and of the future prospects of labour. They were taking advice from the experts and scientists. They were also working in coöperation with the Ministry of Food, which was the buyer and provider for the nation, and the Ministry of Food had nutrition experts who were available to give advice.

## QUESTION TIME

### Scottish Central Medical War Committee

IN reply to a question addressed to the Secretary of State for Scotland Mr. COLVILLE said that on Sept. 1, 1939, in accordance with prearranged plans drawn up by the Government, he had instructed the Scottish secretary to the British Medical Association to convene the Scottish Central Medical War Committee. Its functions are, he said, to advise the Government on the allocation of doctors in Scotland to H.M. Forces and to civilian services connected with the war, and generally to represent the profession in Scotland in any negotiations with the Government affecting questions of medical personnel. Mr. Colville gave a list of the members of this Committee as follows:—

Members of the former War Emergency Committee of the Scottish Committee of the British Medical Association: Dr. D. Elliot Dickson, Dr. J. G. McCutcheon, Dr. G. W. Miller, Dr. J. B. Miller, the Scottish Secretary. Members appointed directly by the Scottish Committee of the British Medical Association: Dr. D. Dale Logan, Dr. G. MacFeat, Dr. A. H. Macklin.

Liaison with the Central Medical War Committee, England, Dr. G. C. Anderson.

Appointed by: University of Aberdeen, Prof. David Campbell; University of Edinburgh, Prof. Sydney Smith; University of Glasgow, Prof. J. R. Currie; University of St. Andrews, Prof. F. J. Charteris; Royal College of Physicians of Edinburgh, Dr. Alex. Goodall; Royal College of Surgeons of Edinburgh, Mr. D. Stewart Middleton, F.R.C.S.E.; Royal Faculty of Physicians and Surgeons of Glasgow, Dr. John Henderson.

Representative of the Teaching Hospitals in Scotland, Colonel A. D. Stewart.

Appointed by: Scottish Branch of the Society of Medical Officers of Health, Dr. W. G. Clark; Scottish Association of the Medical Women's Federation, Dr. Gladys Boyd; Scottish Association of Insurance Committees, Sir William Marshall, Mr. Thomas J. Addly.

Chairman of the Insurance Acts Subcommittee (Scotland) of the British Medical Association, Dr. J. F. Lambie.

Liaison Officers of the British Medical Association in Scotland (not otherwise members of the Committee), Dr. D. G. Leys, Dr. Middleton Connon, Dr. I. D. Grant.

Representative of the Scottish Central Dental War Committee, Dr. A. C. W. Hutchinson.

Coöpted Members, Mr. T. H. Graham, Mr. J. J. M. Shaw, F.R.C.S.E.

Highlands and Islands Area, Dr. J. B. Simpson.

Officers of the following Government Departments attend meetings of the Committee: Royal Naval Medical Service, Royal Army Medical Corps, Royal Air Force Medical Service, Department of Health for Scotland, General Board of Control for Scotland, Air-Raid Precautions Department, Ministry of Home Security, Ministry of Pensions.

### London Hospital Sectors

Sir ERNEST GRAHAM-LITTLE asked the Minister of Health how many members of the honorary staffs of the voluntary hospitals in London had accepted part-time service up to date; what was the cost to the Exchequer of this reorganisation of the Emergency Medical Service; how many beds at the teaching hospitals had been reserved by his department for casualties and at what cost.—Mr. WALTER ELLIOT replied: In the London hospital sectors 519 whole-time officers of consultant or specialist grade in the Emergency Medical Service have elected to transfer to the arrangement under which they receive a salary of £500 a year for whatever services are required of them. This reorganisation has effected a saving to the Exchequer at the rate of £160,300 a year. The number of beds now maintained at the twelve London teaching hospitals for casualties is 1946, for which an average weekly payment of £6386 is being made on account, pending ascertainment of the actual cost properly involved.

### Hospital Beds in London

Sir E. GRAHAM-LITTLE asked the Minister whether he was aware that partly as a result of the reservation of beds, the number available for civilian cases, and, consequently, for teaching purposes, had diminished to one-third of the normal complement, with the result that medical education in London had been disorganised; and whether he proposed, in view of the reorganisation he had effected, to review the whole position in the near future.—Mr. ELLIOT replied: The number of beds available for civilian cases in the London area as a whole is considerably greater than before the war, although the number available in the central part of the area has been reduced owing to war measures and the necessity of maintaining a certain number of beds for casualties. Some disorganisation of medical education has undoubtedly taken place, but the clinical education of students has been carried on at various hospitals, both municipal and voluntary, under the London sector scheme. The question of reopening further beds in the central area will certainly be reviewed in the light of experience.

### Medical Volunteers

Mr. LIDDALL asked the Minister how many of the 63,500 on the medical register had volunteered for the navy, army and air-force medical services since the declaration of war; and whether he was satisfied that an adequate number of medical men were being left in this country to meet the ordinary needs of the civilian population, and to cope with any possible emergency.—Miss HORSBRUGH replied: Of the 45,000 registered medical practitioners in Great Britain and Northern Ireland, 3001 have voluntarily joined the forces as medical officers, in addition to those called up by virtue of their obligations as territorial or reserve officers. My officers are in consultation with those of the service departments with the object of securing a fair distribution of the available doctors between the forces and the emergency and other civilian services.

### Medical Treatment of Evacuated Children

Mr. SORENSEN asked the Minister whether adequate provision of sick bays and of hospital treatment now existed for evacuated children in all existing reception areas; whether he was satisfied with provisional medical arrangements for children likely to be evacuated in the new evacuation scheme; and whether similar plans for the treatment of sick and ill evacuated children as had been adopted by the Essex county council also existed in other comparable counties.—Mr. ELLIOT replied: I consider that the arrangements which have been, and are being, made should be adequate. I am not clear what special provision in Essex, differing from that in other reception areas, is referred to.

### Exemption of Students

Mr. GROVES asked the Minister of Labour and National Service whether he was aware that men registered as medical students prior to Sept. 3, 1939, in order to be exempt from military service must have passed their first professional examination and completed two years of study in anatomy and physiology; and whether he would now consider exemption from military service of all men registered as medical students prior to Sept. 3, 1939, while they were satisfactorily pursuing their studies.—Mr. ERNEST BROWN replied: After consultation with the Minister of Health and the Secretary of State for Scotland, and with representatives of the medical teaching bodies, it was decided that medical students who have passed their first professional examination and have completed two terms (not years, as suggested in the question) of study in anatomy and physiology shall be reserved under the schedule of reserved occupations. This arrangement secures adequate reservation of medical students at the present time, and I see no reason for any change of the kind suggested.

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*Corrigendum.*—Our attention is drawn to an error in the paper by Stuart-Harris, Wilson Smith and Andrewes in THE LANCET of Feb. 3. In fig. 2 (p. 209) the legend should read: Black columns represent virus-positive cases and white columns virus-negative cases.

## CONSCRIPTION OF DOCTORS

Two months ago the Central Medical War Committee suggested to the Minister of Health and the Minister of Labour that medical men within the age-limits of current proclamations should be made liable for compulsory medical service with the forces, the compulsion to be applied through the machinery of the central committee. The Minister of Labour has now excluded the medical profession from the schedule of reserved occupations, and male doctors under the age of 41 will be liable for compulsory service, subject to proclamation, in a medical capacity. The C.M.W.C. will advise the Government on the application of the liability in the light of the needs of civilians.

Medical men, like other men, will register in accordance with the programme announced from time to time by the Ministry of Labour. Those under 28 on Jan. 1, 1940, fall within the current proclamation. The "under 25's" have already registered; the 25's and 26's are registering this month; and the 27's will probably register in June. It is not proposed at present to fix a higher age for registration for doctors than for other citizens, but the question may have to be reconsidered later if the normal process of registration does not provide a wide enough field for selection. When doctors register at the employment exchange they will fill up the Central Medical War Committee's form of questionnaire, and the committee will enter the information in the National Register. Practitioners who registered as students will fill in a similar form six months after qualification. The names of doctors who have registered and who have completed six months since qualifying will be conveyed to the local medical war committees who will place the letter "R" against their names in their records.

To meet service demands, actual or anticipated, the C.M.W.C. will allocate quotas, classified under the various branches of practice, to local committees, who will recommend the required number of doctors, excluding those who have been qualified for less than six months and those who obtained house-appointments within six months of qualification and who have not yet completed six months in that appointment. Local committees will make up their quotas from those men on the "R" list and volunteers who can most easily be spared. In doing so they will not take into consideration either medical fitness or personal hardship. Any doctor provisionally recommended by the local committee will be informed of this decision and afforded an opportunity to make representations in writing or in person at the committee's next meeting. In the case of insurance practitioners, and those holding whole-time or part-time appointments under local authorities, voluntary hospitals, and so on, the insurance committee or the authority concerned will have the opportunity of expressing its views. In the case of doctors in the E.M.S. the views of the group officer or hospital officer will be considered. When all representations have been taken into account the local committee will transmit the names of those chosen to the central committee, who will inform them that they have been recommended for immediate service. The central committee will also exclude from consideration questions of personal hardship, and in due course will submit a list to the service departments. The central committee will, as far as possible, give consideration to any strong preference expressed by a practitioner for a particular service.

The next step is for the service departments and the Ministry of Labour to arrange for the medical examination, interview and calling up of the selected doctors. Within two days after his medical examination a practitioner not rejected on medical grounds may apply to the Ministry of Labour for postponement of calling up on the ground of exceptional hardship, and on that ground alone. His application, if not granted by the Ministry, will be referred to a military service (hardship) committee and there will be a right of appeal under certain circumstances to an umpire. A medical man desiring to make application as a conscientious objector should intimate his objection at the employment exchange when he registers.

Newly qualified men, as they become liable for conscription, will be dealt with by the C.M.W.C. As hitherto, the Committee of Reference will assume the functions of local medical war committees in London in dealing with consultants and specialists on the staffs of London hospitals, as well as with registrars, chief assistants and the like holding teaching appointments in London hospitals. Pathologists will be dealt with in the first instance by the usual local machinery, and where necessary the central committee will consult the Medical Research Council about them at a later stage.

## STUDENTS IN CONFERENCE

OVER a long weekend after Easter 550 students met in Leeds to consider their rôle in the world today. The congress was organised by the National Union of Students. One commission considering the health services included students of medicine, education and natural and social sciences, and got down to medical problems in relation to modern social conditions. The difficulties of medical practice insuperable under existing social conditions would, it was agreed, yield only to some radical alteration in the conditions of life of the population as a whole, and the congress passed by a vote of 448 to 1 a resolution urging a unified and comprehensive system of free health services. In any case, the national health insurance scheme should be extended to include dependants and old-age pensioners. Later in the congress 40 medical students from eleven different schools discussed the relationship between medical and other students. A feeling of isolation was admitted and attributed to "the faculty management of medical societies." Nevertheless, students at Liverpool, Oxford and Cambridge had shown their ability to respond, given the right circumstances. Any satisfactory staff-student relationship was also held to be barred by the executive of the medical societies. The position of women in medicine should be adjusted by an immediate attempt "to rationalise the irrationalities existing in certain schools." On the medical curriculum opinion was divided between removal of some of the scientific subjects and the correlation of anatomy and physiology more closely with clinical practice. Experience of general practice and training in psychology were also emphasised and a compulsory year of internship before qualification. In their own commission it is stated medical students did not discuss curriculum so much from the view-point of a safe and easy transit through examinations as the opportunity given to become good citizens.

ROYAL SANITARY INSTITUTE.—A discussion on food in war-time has been arranged by this institute for 5 P.M. on Tuesday, April 16, at 90, Buckingham Palace Road, London, S.W.1. Prof. S. J. Cowell will be the first speaker, and the chair will be taken by Sir Wilson Jameson.

# LETTERS TO THE EDITOR

## PEPTIC ULCER IN THE SERVICES

SIR,—I am happy to feel that Professor Pannett in his letter of March 30 does not dispute the contention that it is in the interests of all concerned that young sailors, soldiers, and airmen found to be suffering from peptic ulcer should be returned to civil life as soon as possible. But he is mistaken in assuming that my experience does not include many of the older and more chronic cases which have been treated surgically; it has been my misfortune to encounter very serious and resistant cases which had previously been treated by many of the most distinguished surgeons in Great Britain. That the latest of these was a man who has had five serious hæmorrhages during the last nine years, following resection of the duodenum by Professor Pannett, is a coincidence from which no conclusion should be drawn except perhaps that neither the surgical nor the medical treatment of this disease has yet reached that state of perfection which we all desire to see.

I am, Sir, yours faithfully,

London, W.1. T. IZOD BENNETT.

SIR,—In this discussion it is important not to lose sight of the essential questions which are:—

1. Whether soldiers who suffer from a chronic gastric or duodenal ulcer should be subjected to a partial gastrectomy or partial duodenectomy whilst in the army.
2. Whether if so operated upon they would be capable of useful service.

Bearing these in mind the investigations carried out by Sir Henry Bashford, valuable as they were, are rather irrelevant. For they refer, in the case of duodenal ulcer, to the results of gastrojejunostomy, which, as every surgeon knows, are as unsatisfactory as he declares; and in the case of gastric ulcer no attempt has been made to discriminate between the various operations which have been practised.

Sir Arthur Hurst again refers to the failures of gastrectomy. These failures are admitted by surgeons. They amount to 13–16 per cent.; but this is not a very discreditable number when it is remembered that these operations are only performed when medical measures have proved a failure. And he neglects to mention the 84 per cent. of patients who react to the turmoil and affronts of ordinary life, apparently as normal individuals. Perhaps the practicability of some of them returning to military duty is not so absurd as both he and Dr. Bennett think.

Mr. Ellison Nash assumes that after these operations prudence in diet is always demanded. This is not so. Three months after the operation patients can usually eat any kind of food without discomfort, though not in large quantity. They must have small meals. Twelve months after the operation even this disability has gone, for the stomach has adapted itself to the new conditions. He goes on to say that the expense of surgical treatment for these patients would in very few cases be a good investment for the state, and makes the following astonishing remarks: "It is fairer to all concerned to release them from service. They can still receive operative treatment as civilians." It is a curious sort of fairness to a patient to withhold from him treatment which in over 80 per cent. of cases will restore him to health, and to throw upon him the burden of seeking out surgical treatment when he is re-entering civil life with perhaps poor prospects, rendered the more uncertain by his gastric invalidism.

If these men were operated upon in the services, some would be able to carry out their ordinary duties, some would be able to perform duties which did not necessitate undergoing great physical hardship. Perhaps 16 per cent. would still suffer. Even though the rule were made that all peptic ulcer patients should be discharged from the army, the state would find it an immeasurably good investment if they received adequate treatment before dismissal. Not only would much time be saved if the onus of obtaining such treatment were not delegated to the individual on his entry into civil life, but a large proportion of fit men would be returned to carry on activities which are as essential to the prosecution of the war as those of the soldiers themselves.

I am, Sir, yours faithfully,

Basingstoke. CHARLES A. PANNETT.

## INFECTIVE HEPATITIS AND CATARRHAL JAUNDICE

SIR,—In a letter in your issue of March 30 Dr. Hope Simpson quoted some experiments in America into the causes of arsphenamine jaundice which "revealed that a high carbohydrate diet was, surprisingly, a predisposing cause of this type of liver necrosis, and that the liver could be fortified by a diet rich in fats." If, perchance, recent work on this subject has escaped their notice Dr. Simpson and your readers will be interested to learn that Craven's conclusions, to which he refers—and to which I have also given some prominence—seem now to have been completely contradicted by the work of W. J. Messinger and W. B. Hopkins (*Amer. J. med. Sci.* 1940, **199**, 216), which shows that, whereas fats promote liver damage by arsphenamine compounds, the best protective of the liver against this form of poisoning is a protein diet and after this a carbohydrate one.

I am, Sir, yours faithfully,

Eccleston Square, S.W.1. L. W. HARRISON.

## FRACTURED FEMUR IN CONVULSION THERAPY

SIR,—Age is the great cause of the fracture discussed in the article Dr. Rankine Good has criticised (*Lancet*, March 23, 1940, p. 575). His categorical statement that in his experience "age or prolonged inactivity bear no relation to the incidence of fractures" is contrary to all surgical experience. Here is a table of age-incidence in the last 100 patients whose intracapsular femoral neck fractures I have immobilised with a Smith-Petersen nail. The list does not include patients too senile to submit to operation, or whose X rays showed a bone architecture too frail to hold the nail effectively. Convulsion-therapy fractures are not included.

| Age-group | Patients | Age-group | Patients |
|---|---|---|---|
| 20–29 | 2 | 60–69 | 38 |
| 30–39 | 3 | 70–79 | 23 |
| 40–49 | 3 | 80 and over | 15 |
| 50–59 | 16 | | |

Of these, 80 were women. Thus 92 fractures were in patients of 50 years and over, and only 8 in patients under 50. In 4 of the latter group the fracture occurred in a limb partly paralysed as the result of poliomyelitis. Our statement that "convulsion therapy should not be used in the elderly" was too dogmatic. We would amend it to "Have a care with the elderly and in those who have had prolonged

periods of inactivity, for surgical experience teaches that the bones in such patients may fracture from trivial violence."

We agree with Dr. Good that the patient should be unrestrained during the convulsion, restraint may well increase the incidence of fractures. Indeed we go further and advise against covering bed-clothes during the convulsion. The patients discussed in our article were not restrained, in consequence we were forced to seek other explanations for their fractures.

In laying the main blame on the force of the muscular violence in intracapsular femoral neck fractures during convulsion therapy we were impressed by the age-incidence in the 10 fractures reported in detail. All the patients were under 40 years, a marked contrast to our previous experience with this fracture. The force of the muscular contraction must also be the cause of the more common lesions in convulsion treatment—namely, dislocation of the jaw and compression fractures of the vertebral bodies.

A distinguished Australian psychiatrist has recently stated that "Cardiazol is the elixir of life to a hitherto doomed race" (*Med. J. Aust.* 1939, **2**, 430). If that is the truth of the matter, then a fracture is a small price to pay for such benefit.

I am, Sir, yours faithfully,

Richmond, Surrey. WILLIAM GISSANE.

SIR,—Dr. Rankine Good disputes certain of the conclusions reached by Mr. Gissane, Mr. Rank and myself in our article in THE LANCET of March 9. He does not agree that the fractures are the result of muscular violence in rather brittle bones but considers the most important factor in their ætiology to be restraint of the patient during the convulsion by excessively enthusiastic doctors and nurses.

Our contention that the bones in these patients were more brittle than normal was based on the observations of orthopædic specialists of considerable experience (Mr. Gissane and Mr. Rank) when they bored the bones for the insertion of Smith-Petersen nails, and seems indisputable.

Regarding the strength of muscular contraction, I agree with Dr. Good that there is little difference between the pattern of epileptic and Cardiazol fits, but I still maintain that in certain cases cardiazol convulsions are muscularly more powerful than those of epilepsy. That muscular contractions can in themselves cause fractures of bones is shown by their occurrence in cases of tetanus where the patients have previously been in perfect health. Moreover, I have described a case of fractured femur due to an epileptic convulsion (*Brit. med. J.* 1939, **2**, 1227) and come across a case of fractured vertebræ in an epileptic exactly similar to those resulting from cardiozol convulsions (paper now in the press).

Finally, may I point out that in none of our cases was restraint of any sort used on the patients during fits since I also hold the opinion that restraint of any form is highly undesirable. This seems to refute beyond doubt Dr. Good's conclusion.

Dr. Rankine Good also says that he has treated many elderly people with few fractures of the long bones, but his 2 fractures out of 80 cases treated is not an excessively low incidence. My search into the literature on cardiazol shows that in 3000–4000 cases fractures of the femur occurred in only 0·66 per cent. and of any of the long bones in slightly over 1 per cent. Before we accept Dr. Good's contention that "age and prolonged activity bear no relation to the incidence of fractures" and that "it would be a pity if someone were prevented from employing it in elderly people or those who have been inactive for a long time by the article referred to" considerably more evidence is needed.

The final verdict regarding this treatment must be based on the proportionate risks of complications versus the chance of improvement unobtainable by any other method. I personally consider the former of sufficient importance to warrant a careful selection of cases likely to benefit and in my experience patients who do not benefit by the time they have had ten injections (i.e., fits) extremely rarely do so afterwards. I now make it a practice never to give more than ten fits if there has not been very definite improvement.

I am, Sir, yours faithfully,

DONALD BLAIR.

Cane Hill.

## THE E.M.S. TODAY AND TOMORROW

SIR,—I have read with interest Mr. Somerville Hastings's comments on my article. His main point of disagreement is in the necessity of allowing heads of departments the power to engage in a certain amount of private practice. I believe this to be essential because the best men in the profession should be incorporated in the new service and it seems extremely unjust that those capable of paying should be deprived of the services of such men; nor can I see why those providing the skilled medical help should be denied the reward of their skill and labour. The fact however that Mr. Somerville Hastings does disagree with me on this point confirms my view that there are certain to be considerable divergencies of opinion and thus it is of the utmost importance that a representative body be formed as soon as possible to discuss fully all such divergent views, and to draw up an authoritative scheme for the future of British medicine. I agree with Mr. Somerville Hastings that those engaged in municipal medicine should be represented on such a body.

I am, Sir, yours faithfully,

Weymouth Street, W.1. JAMES WALTON.

## THE BIRTH OF THE E.M.S.

SIR,—In your issue of March 23 Sir Ernest Graham-Little wrote that a committee appointed by Sir Samuel Hoare, of which I was chairman, was responsible for the degrading of the London hospitals, for the dispersal of students and for the terms of service of the E.M.S. In your issue of April 6 he readily admits this committee was not responsible, that it had in fact nothing to do with these measures. It was the only purpose of my letter to correct a question of fact. Otherwise I was not concerned with the responsibility for these measures. That was taken once and for all by the Government when it accepted the Air Ministry's estimate of casualties. The province of the medical advisers of the Government was not to criticise those figures but to make preparations on the assumption that they were correct. If they had proved accurate there could have been no alternative to these steps: for example if casualties had occurred on such a scale private practice would have ceased.

Sir Ernest refers to my "eulogy" of the E.M.S. in a letter to the *Times* of Dec. 6; the paragraph in question reads:

"Finally I have to ask: Has the education of the medical student suffered? It is not true that the students have been left to their own devices. Presently they will return to London with some insight into the structure of public health services. By their dispersal over the sectors something has been lost but

much has been gained. A conclusion of that kind is fortified by the students' own verdict which, so far as it can be ascertained, is friendly to the system. They live in the sector hospitals and their number in any one institution is small. The large class is gone. In its place there is intimate contact between student and teacher. The teacher is always in the hospital, the student shares his day. And when the work is done student and teacher go to the same building, they talk and play together, they live together, with incalculable gain to both. This means much; it is a new relationship that is worth preserving. The physicians and surgeons of the Emergency Medical Service have built better than they knew."

The words Sir Ernest quotes—namely, the final sentence—plainly refer to medical education; in the rest of the letter there is not a word of eulogy of that service. I ask you to print the passage to emphasise once more a memorable educational experiment. In normal circumstances a student has to rest content with a fraction of the physician's day, whereas for some months after the outbreak of war the teacher was always in the hospital and the student shared his working hours. With the return to London of many teachers on part-time service these conditions have already passed away. They will not recur in my time but I cannot doubt that we have seen the birth of a new relationship between the student and his teacher, of which more will be heard. Meanwhile to record the student's appreciation of his unusual fortune is not to argue that the London schools and their Government grants should be scrapped.

I am sure that Sir Ernest is at heart more interested in an educational adventure of this kind than in scoring debating points, which is perhaps hardly a game for grown-ups in these times.

I am, Sir, yours faithfully,

C. M. WILSON.

## THROMBOSIS OF THE SUPERIOR VENA CAVA

SIR,—The annotation under this heading in your issue of March 23 (p. 559) recalls to my mind a note which I contributed more than forty years ago to your Mirror of Hospital Practice (*Lancet*, 1898, **2**, 206). It was entitled "Three cases of extensive venous thrombosis associated with severe rheumatic carditis," under the care of W. B. Cheadle and D. B. Lees. One of these was a case of thrombosis of the superior vena cava and its tributaries, fatal from pulmonary embolism due to detachment of a portion of the clot in the vena cava. The illustration was reprinted with your permission in "Researches in Rheumatism" (Poynton and Paine, 1913).

The note is historic because it was the first attempt in this country to show by pathological investigation that this thrombosis was not merely obstructive in origin but due to rheumatic inflammation of the wall of the vein, and an indication of the infective nature of juvenile rheumatism; it was quoted in several editions of Osler's Textbook of Medicine. Since then I have seen at least ten cases of venous thrombosis in juvenile rheumatism, several affecting the innominate veins, the most interesting being a thrombosis of the inferior vena cava in a case of severe rheumatic chorea, with a result strictly comparable to that seen in the same condition associated with typhoid fever. Later (*Lancet*, 1933, **2**, 966) Bruce Perry confirmed and carried further the study of these cases as probably infective.

The original drawing together with all the other original illustrations by Paine and myself, published and not published, are in the safe custody of the medical school of Harvard University. Since those early days it has been recognised that juvenile rheumatism not only attacks the heart but all the vascular system, from the origin of the aorta to the superior vena cava, including the blood capillaries. There is a good illustration of this venous thrombosis by B. Schlesinger in "Recent Advances in the Study of Rheumatism" (2nd ed. 1937).

I am, Sir, your faithfully,

Bath. F. JOHN POYNTON.

## STRETCHER FOR ABDOMINAL WOUNDS

SIR,—Mr. T. B. Layton in his instructive article on the Transport of Wounded has stressed the importance of placing a patient with abdominal wounds in the Fowler position as early as possible and of transporting him in this position. Sergeants Harris and Young, both of the R.A.M.C., have worked out a means of carrying this out, making use simply of the ordinary service stretcher, and the suspension bar of the Thomas splint. The accompanying illustration serves best to describe the means of transport, and the patient can be wrapped in three blankets, a method which, as Mr. Layton rightly states, has saved many lives.

Service stretcher adapted for Fowler position: (*a*) suspension bar of Thomas splint; (*b*) stretcher pillow tied to suspension bar; (*c*) spare pillow; (*d*) spare pillow, to be placed under the three blankets so as to be able to be made fast to the suspension bar, thus acting as donkey and firmly holding patient; (*e*) strong tape fastened to each end of donkey and to suspension bar.

I am, Sir, yours faithfully,

M. DE LACEY,
Major, R.A.M.C.

## THE NAME OF INFLUENZA

SIR,—Renaming diseases is never easy and many, like the Secretary of State for War who has been told he ought not to call epidemic influenza by that name, will continue to refuse the advice (*Lancet*, March 23, 1940, p. 571). Common sense on this occasion is in agreement with the present medical evidence.

Dr. Stuart-Harris and his co-workers (*Lancet*, Feb. 3, 1940, p. 205) wish to use "epidemic influenza" to indicate only the condition of influenza-virus infection and we others must be content with "febrile catarrh" for our old familiar "influenza" or "'flu." Clinical experience never supported the idea that virus influenza was distinct from other conditions usually called influenza. Any two epidemics of virus influenza or any two epidemics of ordinary influenza show as much dissimilarity as is shown in Stuart-Harris's table demonstrating the percentage frequency of symptoms. I wish that your statement that "It is highly probable therefore that a disease exists which is clinically indistinguishable from epidemic influenza yet is not apt to occur in such widespread epidemics" were true. The

epidemics of which I have had experience and from which the virus was unobtainable have spread in a school community and in the whole country with as great rapidity as virus infections; as Stuart-Harris states, "No sharp distinction was possible between the outbreaks—i.e., of virus and not-virus influenza—on clinical and epidemiological grounds."

This change of mind is very welcome but it does not give the right to change the names. Let us keep influenza, even if qualified by the adjective epidemic, for that disease which with almost monotonous regularity attacks large numbers of an exposed population usually in the winter or early spring, causing congestive pharyngeal, respiratory and sometimes gastro-intestinal symptoms, and if the virus-form must have a special name let us call it something else.

I only met Sir Patrick Laidlaw once, but I am sure he would have agreed with the last paragraph. His contribution to our knowledge of influenza was the greatest of all and may we not commemorate this by calling virus influenza Laidlaw's influenza? This would be analogous to Addison's anæmia, Jacksonian epilepsy or Gaucher's splenomegaly. The names of the discoverers live because they clearly differentiated one form of the syndromes in which they were interested from the large number of cases encountered. I believe the same will be true of Laidlaw.

I am, Sir, yours faithfully,

Rugby. R. E. SMITH.

## AIR PURIFICATION BY HYPOCHLOROUS ACID

SIR,—On p. 581 of your issue of March 23 you call attention to the purification of air by means of hypochlorous acid and briefly summarise the facilities offered by Milton Proprietary for carrying out such a system. You make the statement that "to achieve almost complete sterilisation of an occupied room with inoffensive concentrations of hypochlorous acid of the order of 1 in 10 million of air takes some hours, but, as would be expected, the greatest reduction occurs soon after spraying has commenced." I venture to correct both parts of this statement.

In my original report A System of Air-Purification by Hypochlorous Acid Gas, table II gives the results in an inhabited room of 10,000 cubic feet, wherein it is shown that the percentage germ-reduction increased steadily during 1 to 5 hours from 50 to 85 per cent. This was obtained by two hours' spraying with a very weak solution of only 2 g.p.l. of available chlorine. Subsequently the same room under similar working conditions was treated with a full 10 g.p.l. solution for 15 minutes, and complete sterility was obtained within half an hour after spraying. In this instance a filtration method was used instead of deposition. The concentration of HOCl was approximately 1 in 17,000,000.

Amid the extensive data we have obtained, with all the varying conditions of size and condition of room, air-currents, number of inhabitants, method of spraying, &c., there emerges one definite law. Given a concentration of HOCl above a certain amount, varying between 1 in 10,000,000 and 1 in 20,000,000 almost complete sterility will be obtained. How quickly this result is attained depends upon the efficiency of the vaporising apparatus in producing and diffusing its gas. On p. 14 of the report it is shown that 1 c.cm. of hypochlorite vaporised in just over one minute in a room of 1000 cubic feet (a concentration of 1 in 15,000,000) heavily charged with *B. prodigiosus* gave a 99·75 per cent. degree of sterility in 15 minutes.

I hope these instances are sufficient to show that with dilute solutions the degree of sterility ascends gradually from hour to hour, and that with strong solutions an "almost complete sterilisation" can be produced by an operation of one minute or more according to size of room, which repeated as required should maintain such sterility indefinitely. One part in a million of HOCl can be inhaled with impunity and it is the enormous difference between this and the minimum lethal dose for air-borne germs which gives a unique character to this system.

I am, Sir, yours faithfully,

Ebury Street, S.W.1. A. T. MASTERMAN.

*** If the germs in the inhabited room were reduced by a half during the first hour's spraying and 15 per cent. survived the fifth hour it is evident that the rate of destruction must have fallen off. But we are in full agreement with Dr. Masterman that hypochlorous acid is a very efficient agent for reducing the bacterial content of air.—ED. L.

## HÆMORRHAGE IN THE NEWBORN

SIR,—After reading the leading article in your issue of April 6, I thought my recent experience of a case in my practice might be of interest. The baby had a severe hæmatemesis and severe melæna on the second day after birth. I injected 0·2 c.cm. snake-venom solution (Moccasin, Lederle). There was no more hæmatemesis but one or two rather tarry motions. Next day to be on the safe side I injected another 0·1 c.cm. There were no further hæmorrhagic symptoms.

I am, Sir, yours faithfully,

Chelford. E. S. EVANS.

## ECONOMY IN PRESCRIBING

SIR,—Some of the hints for prescribers that you base on the statement issued by the Medical Research Council (*Lancet*, April 6, p. 660) are surprising. It is sound enough to reserve the sugar for children and leave the bitters for adults with coarsened palates, but it would be interesting to know for what "other purposes" glycerin is wanted. "Do not substitute glycerin for syrup," you say, "because glycerin is wanted for other purposes." Long before the war the trade and technical press told the world, in effect, that in warfare glycerin was a museum piece along with battle-axes and bows and arrows; the world's markets were glutted with glycerin and prizes offered for new uses for this waste product of the soap industry. It is true that no soap is being made in Germany but the rest of the civilised globe is still washing itself and the price of medicinal glycerin is the same today as it was in August last year. It is true that some manufacturers and many retail chemists were prompted to buy more than their usual quantities of glycerin in preparation for sugar rationing and it is true that soap-makers hesitated to supply abnormal demands; but beyond that there is nothing peculiar about the glycerin market. On the other hand saccharin is a tax-gatherer; it is far more heavily taxed than the multi-millionaire; glycerin pays the same direct tax as the pauper does—namely, nil. Of course that may have nothing to do with the case, but if it has, why not say so? Another doubtful hint is the advice to be careful in prescribing ephedrine, when as a matter of fact the London market is so overloaded with this product that dealers are shouldering each other out of the way to get first to the buyer. It is a surprise, too, to be told to hold aloof from gentian root, a drug which our French friends are only too glad to let us have in abundance. It is doubtful

if panel patients will respond so quickly to kaolin as to bismuth carbonate, if only for the reason that the dear old stock mixture looks different. There are other points in this article over which the general practitioner, the statistician, the shipper and the economist could spend a happy haif-hour.

I am, Sir, yours faithfully,

London, S.W.1. F. C. GOODALL.

### VITAMIN E AND NEUROMUSCULAR DISEASES

SIR,—In his letter in your issue of March 9 Mr. Graves of Vitamins Ltd. lays stress on the hypothesis that wheat germ contains an unidentified myo-neurotrophic factor, and that this factor is responsible for the remarkable results reported in THE LANCET of Jan. 6 (p. 10). Professor Demole, however, in his letter of March 2, marshalled ample evidence to show that this hypothesis is quite unnecessary and that only one factor, namely alpha-tocopherol, is needed to prevent paralysis &c. in experimental animals on a diet deficient in vitamin E. Clinical results will be even more convincing and I would therefore draw attention to a paper by Wechsler published in the *Journal of the American Medical Association* of March 16. Wechsler treated six cases of amyotrophic lateral sclerosis with pure synthetic alpha-tocopherol and obtained remarkably good results in two.

I am, Sir, your faithfully,

H. J. W. FRANCE,
Managing Director, Roche Products Ltd.

### FEES FOR WALKING THE WARDS

SIR,—The announcement in THE LANCET of April 6 (p. 673) that St. George's medical school is paying fees to the Middlesex county council in order that students may be allowed to receive tuition in the wards of one of their hospitals raises the question why a similar payment should not be made to a voluntary hospital. It would seem to be analogous to the fees paid by the students of Scottish medical schools to the hospitals for the privilege of walking the wards. Although efforts to assess the additional cost of a hospital, where there is a medical school attached to it, have not yet been successful it is generally admitted that the hospital cost is higher on that account. Even it were not so, access to the hospital surely has a definite value to the students which deserves financial recognition.

I am, Sir, yours faithfully,

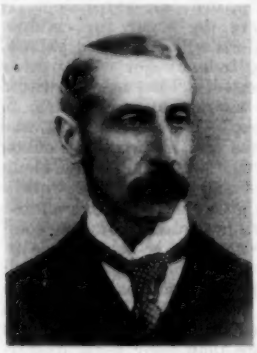
Temple, E.C.4. C. E. A. BEDWELL.

# OBITUARY

## CHARLES SLATER

M.B. CAMB., M.R.C.S., F.C.S.

Dr. Slater, who died at his home near Tunbridge Wells on March 15, had retired before the last war from directing the clinical laboratories at St. George's Hospital, but his memory is still cherished by St. George's men for he was one of the most generous of friends and most courtly of colleagues. Born at Southport in 1856, he went to Clifton College for two years and from there with a foundation scholarship to St. John's College, Cambridge, taking a second class in the Natural Sciences Tripos in 1878. In later life he discharged his debt to St. John's by endowing a research studentship there. He brought out in collaboration with Pattison Muir a primer of elementary chemistry and became F.C.S. before completing his clinical studies at St. George's Hospital from which he qualified in 1884. He was then medical registrar at the hospital and when his mind turned from pure chemistry to bacteriology he went to the Pasteur Institute in Paris and from there to Berlin, intending to include Copenhagen, but his continental study was cut short by his call to St. George's to be hospital bacteriologist at a salary of £100 a year "to include all laboratory expenses." At the same time he was appointed lecturer on bacteriology in the medical school and later became university reader in bacteriology. It was the beginning of a new department at St. George's and it was not long before the laboratory needed enlargement to cope with the work Slater was called upon to undertake. The teaching of state medicine drew students to his laboratories from other London schools and from much further afield; finally in 1895 new laboratories and classrooms were built of which he became director for the next 25 years. On his retirement at the age of 57 his affection for his old school was in no way diminished and at the bicentenary in 1933 he quietly sent a cheque for £10,000 with which to build a new clinical laboratory. At Tunbridge Wells to which he retired he helped to make the project for the new Kent and Sussex Hospital a success, and kept in touch with its growth and development. His retirement gave him more time for painting and photography and for long visits to Switzerland where he had always been an ardent climber. At every stage of his career his reserve and his instinctive avoidance of publicity prevented him from reaping the full reward of his ability; he had a profound knowledge of bacteriology and contemporary medicine, and read both French and German fluently. For a time he was joint editor of the *Review of Bacteriology* and he brought out with Dr. E. J. Spitta a small but excellent Atlas of Bacteriology. The photograph which we reproduce was taken soon after he became director of the clinical laboratories.



*Maull & Fox*

Dr. Harold Spitta writes: During the time when Slater was in full control of the clinical laboratories he threw himself wholeheartedly into research and did his utmost to encourage the younger generation to work in his laboratories and discuss with him matters of interest in clinical pathology. He engaged an assistant bacteriologist, providing his salary out of his private purse, and it was not long before the various laboratories became a hive of industry. Pressure was often brought to bear upon him to publish his work but he was never able to overcome his natural reticence and very rarely would he allow the results of his work to appear in the press. As time went on he would provide scientific apparatus necessary for the prosecution of research out of his private pocket and on many occasions he would help the less fortunate members

of the medical profession with financial support, assistance and advice. The encouragement he gave to the younger men will never be forgotten and conversations with other bacteriologists revealed his sometimes quite astonishing knowledge of contemporary bacteriology and research. The bicentenary gift of £10,000 was followed up by a further bequest of like amount to augment the salaries of workers in the laboratory.

## GEORGE ERNEST WAUGH

B.A. CAMB., M.D. LOND., F.R.C.S.

Mr. Waugh died on April 3 at King's Sutton, Northants, where he was born and his father had practised medicine. He was educated at Epsom College and Downing College, Cambridge, holding a foundation scholarship there, and went on to University College Hospital from which he qualified in 1901. He remained in the dissecting-rooms to become senior demonstrator and teacher of surgical anatomy, and was soon appointed to the surgical staff of the Hampstead Hospital and the Hospital for Sick Children, Great Ormond Street. His major interest was in children's diseases, but he became a versatile general surgeon, possessing an enviable diagnostic balance and a meticulous technique. He did pioneer work in tonsillar enucleation, insisting on deep anæsthesia for carrying it out, and he was elected to membership of various surgical societies, including some in France and America, and to the medical faculty of London University. At Hampstead he became chairman of the medical committee in succession to Sir William Collins and, despite his deafness, bore worthily the mantle of his predecessor. Occasionally he would arrange a committee at his house partly it would seem as an excuse for showing hospitality (including the cigars for which he was famous) to his colleagues.

At Ormond Street he quickly fell under the spell of the place, its traditions and its work, and as resident medical officer worked with many of the best men from Canada, Australia, South Africa and all the British schools of medicine. His example and teaching in those days laid a firm foundation not only for his own future as a surgeon but also for the widespread devotion to the hospital which is found in the Dominions and in England among all who have worked there. His election to the staff gave an added impetus to the study of the surgical diseases of children. More than that, he was a natural leader of men, even those who disagreed with his opinions finding it impossible not to acknowledge his fairmindedness or admire the even temper and willingness to examine and debate the opposite view. His intellect was keen, and his reading and appreciation wide—wider probably than many of his associates guessed; and while he set a high standard for the student and the operator he was a severe critic of his own attainments. Latterly his health failed—he was never robust—but he carried on until the end of his term of service.

He married Ada Hélène, daughter of John Farrington of New York. They had one daughter.

H. A. T. F. writes: George Waugh was always brilliant, always outstanding. At school I was envious, I must confess, of the way in which he reached the top of his class apparently without an effort, certainly without doing any extra work. In the field, if not perhaps so brilliant, he was sufficiently sound to be a member of both the rugby and cricket teams. His gratitude to his old school was shown by the great interest he took in the work of the college council, of which he was a member for many years. Waugh, in my opinion, had a profound influence on the surgery done at Ormond Street. Inspired by Arbuthnot Lane and the late Arthur Barker, his old chief at U.C.H., he was chiefly responsible when medical superintendent for the introduction of aseptic methods, little practiced at that time, and for the institution of a theatre routine and general surgical technique throughout the hospital second to none. It was there that he did most of his pioneer work on total removal of the tonsils and on the surgery of the abdomen.

Waugh was a highly cultured man whose brilliance no-one could fail to realise. But the thing about him which endeared him to his friends, and never failed to impress even a chance acquaintance, was his personality. It was this personality that was chiefly responsible for welding the surgical staff into a team of brothers. He was a man from whom young and old sought advice, on personal as well as professional matters. A mutual friend once said to me, "You never hear George say an unkind word about anybody." His career would have been even more brilliant but for the unfortunate handicap of deafness.

## PHILIP GEOFFREY STAINTON

M.R.C.S., SURGEON LIEUTENANT R.N.

*Lenare*

Surgeon Lieutenant Stainton, who was killed in a motor accident on March 24 while on active service near Cape Town, studied medicine at Guy's Hospital and qualified in 1933. After spending a year as medical resident at Ramsgate General Hospital he went for another year as assistant to Dr. S. S. Rendall in a general practice at Boston, Lincs. He next returned to London for more hospital appointments and then joined the Royal Navy in which he saw three years service before his untimely death. He was 31 years old.

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Mr. J. B. Gurney Smith writes: As a fellow-student of Lieut. E. G. REYNOLDS, although not one of his intimate friends, I knew him well enough to form a high opinion of him as a social personality and as a man. His charm of manner and his radiant smile were infectious to those who came in contact with him. He had that great gift of inspiring confidence. He was a type of conscientious worker that the profession can ill spare.

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THE Sanatorio Español de México has begun to publish as its official organ a quarterly journal entitled *Analecta medica*, the first number being issued for March, 1940. Dr. J. A. Alvarez, director of the institution, contributes an article on accidents in gastroduodenal surgery; Drs. Angel Matute V. and Jesus Salas describe a method of injecting air into the knee-joint in connexion with radiography, calling it pneumofascia; Dr. L. L. Vega discusses the correlation of psychological and physical types in man; Dr. S. A. Sarmiento describes endoscopic injection of the prostate; Dr. Eduardo Arin reviews abnormal radiological appearances localised in and about the oblique fissure of the right lung; Dr. Samuel Morones contributes a few notes on typhoid; and Dr. C. D. Guerrero publishes a case of painless tabetic gastric crises in a woman of 30 whose only symptom was frequent nausea, retching, and vomiting.

# Medical News

## University of London

At a recent examination the following were successful:—

D.M.R.

*Part I.*—H. F. Francis, G. A. Macadie, Esmond Millington, M. A. Stewart and T. A. Watson.

## Royal College of Surgeons of England

The spring course of museum demonstrations is now being given at the college, Lincoln's Inn Fields, London, W.C.2. On April 17 and 24 Dr. A. J. E. Cave will lecture on the anatomy of the head and neck, and on May 1, 8 and 15 on the anatomy of the abdomen. The demonstrations are open to advanced students and medical practitioners and are at 5 P.M.

## Royal College of Obstetricians and Gynæcologists

Mr. Morris Datnow will deliver the third William Blair-Bell lecture at the house of the college, 58, Queen Anne Street, London, W.1, at 3 P.M. on Saturday, April 27. He will speak on Blair-Bell's contributions to science with especial reference to cancer research.

The following have satisfied the examiners and have been awarded the diploma of the college:—

S. K. Christie, Annie M. Dawson, Bessie Dodd, A. G. Edwards, K. A. Evans, John Griffith, Archie Herstein, Mary Kane, B. G. Kearon, Elizabeth G. Keith, E. J. Lace, A. M. Lester, Duncan Malloch, Mabel A. Masih, Elizabeth V. Newlands, Marjorie A. Powys, D. A. F. Shaw, J. R. Sides, C. J. Stewart, Violet E. A. Sykes, Mary R. Thompson, Agnes E. Towers, J. P. Watson, Elined Woodford-Williams and Elizabeth M. Wright.

## Medical Conscription

At its last meeting the executive committee of the Socialist Medical Association of Great Britain passed the following resolution: "The Socialist Medical Association demands that medical conscription shall not be enforced until a national plan has been elaborated whereby allocation can be decided upon to meet the needs of both the armed forces and the civil population so that available medical personnel shall be distributed to the best advantage of all."

## National Association for the Prevention of Tuberculosis

The annual meeting will be held in Tavistock House, Tavistock Square, London, W.C.1, on Thursday, April 18, at 2.30 P.M., when the chair will be taken by the Marchioness of Titchfield. Sir Hugh Walpole will address the meeting, which will be followed by a discussion on tuberculosis care work in war-time.

## Health of the Troops

Sir William MacArthur, director-general of Army Medical Services, told the Unionist Health and Housing Committee on April 4 that in spite of the severe winter there have been relatively few cases of serious illness among the troops and a very light incidence of acute infectious diseases. As regards hospitals, the Army has done reasonably well in competition with the abnormal provision necessary to meet the possible needs of civilians. There is no shortage of military medical equipment, and indeed reserve supplies are adequate for the estimated requirements for six months ahead. General MacArthur referred to the irresponsible complaints which are often forwarded to the War Office by well-meaning civilians. Eighty per cent. of the alleged cases of medical neglect or unhygienic conditions are shown on investigation to have no foundation. Equally troublesome are the false rumours of heavy mortality from such infections as pneumonia and cerebrospinal meningitis. It sometimes seems that such stories are deliberately spread by people who want to create mischief. All things considered the country may rest assured that the medical services are keeping fully abreast of the requirements of our rapidly expanding armies.

## Royal Microscopical Society

The annual meeting of this society will be held at B.M.A. House, Tavistock Square, London, W.C.1, on Wednesday, April 17, at 3.30 P.M., when Mr. P. N. Bhaduri, Ph.D., will read a paper entitled Improved Smear Methods for Rapid Double Staining.

## Sulphapyridine and Sulphonal by Prescription only

The Poisons (Amendment) Rules 1940 and the Poisons List (Amendment) Order 1940 came into operation on April 1. Their main effect is to bring sulphapyridine within part 1 of the Poisons List and also to make it subject to the fourth schedule to the Poisons Rules. As a consequence this product can now only be supplied on prescriptions, as is already the case with sulphanilamide and allied substances. Another effect of the amendment to the rules is to include sulphonal in the first schedule.

## Exeter's Radium

The report of the trustees of the Devon and Exeter Cancer Fund for the year 1939 was presented at the annual meeting held on March 29 under the chairmanship of Mr. P. F. Rowsell, the founder of the fund. The report states that the chief concern in all radium departments has been the question of safe keeping in the event of air-raids. The solution in Exeter has been to transfer the radium safe to an underground cellar below the west wing of the Devon and Exeter Hospital, which has a thick concrete roof. The radium itself is in metal containers and these are enclosed within 6 inches of metal.

## Nurses' Superannuation in War-time

The superannuation of nurses engaged in the service reserves and Civil Nursing Reserve was again considered at a meeting of the Royal College of Nursing on March 28. The Ministry of Health wrote that the rates of salary of the reserve were calculated to allow for the maintenance of superannuation premiums and that it appeared to the Ministry that the reserve was recruited solely from nurses not in hospital service so that very few members would be participants in the federated scheme before joining. But it was pointed out at the meeting that though the number may be proportionately small, certainly some nurses have joined the reserve directly from hospital service owing to the higher salaries offered; also the scheme is open to private nurses and there are probably some among these who belong to the scheme. Sir Bernard Docker, chairman of the British Hospitals' Association, will shortly present a memorandum, supported by the college and the Federated Superannuation Scheme, on the question of the superannuation of hospital officers and nurses in the various reserves, to Sir George Chrystal. The college is pressing for the payment of the employer's contribution by the military, naval or Air Force authorities.

# Vacancies

*Agent General for Western Australia, Savoy House, Strand, W.C.2.*—Inspector-general of mental hosps. dept., £1100.
*Altrincham General Hosp.*—H.S., at rate of £120.
*Barking Borough.*—Temp. asst. M.O., £500.
*Bath, Royal National Hosp. for Rheumatic Diseases.*—Res. M.O., £150.
*Bury St. Edmund's, West Suffolk General Hosp.*—H.S., at rate of £150.
*Cambridge, Addenbrooke's Hosp.*—H.P., at rate of £130.
*Derbyshire Royal Infirmary.*—H.S. for cas. dept., £150.
*Doncaster Royal Infirmary.*—Cas. H.S., at rate of £150.
*Enfield Urban District Council.*—Asst. M.O.H. for maternity and child welfare, £600.
*Essex Administrative County.*—Third asst. M.O. for Essex County Hosp., £350.
*Folkestone, Royal Victoria Hosp.*—Res. H.S., £130.
*Grimsby and District Hospital.*—H.P. at rate of £175.
*Glasgow Eye Infirmary.*—Res. H.S., £150.
*Gloucester, Gloucestershire Royal Infirmary.*—H.S. to ear, nose, and throat Dept., £150.
*Hereford, Herefordshire General Hosp.*—H.S. for casualty and ear, nose, and throat depts., £120.
*Hampstead General Hospital, Haverstock Hill, N.W.3.*—Temp. phys. to outpatients.
*Hove General Hosp.*—Jun. res. M.O., at rate of £120.
*Hull Royal Infirmary.*—Res. anæsthetist, at rate of £150.
*Ilford Borough.*—Asst. dental surgeon, £450, also R.M.O., £400.
*Kidderminster and District General Hosp.*—Jun. H.S., at rate of £100.
*Lancaster Royal Infirmary.*—Two jun. H.S.'s, each at rate of £130.
*Leicester City.*—Res. M.O. for City General Hosp., at rate of £300.
*Liverpool Sanatorium, Delamere Forest, Frodsham.*—Asst. to med. supt., £225.
*Liphook, Hants, King George's Sanatorium for Sailors.*—Asst. M.O., at rate of £200.
*London Chest Hospital, Victoria Park, E.2.*—H.P. at rate of £100.
*Maidstone, Kent County Ophthalmic and Aural Hosp.*—Two H.S.'s to spec. depts., each at rate of £200.

*Manchester Royal Infirmary.*—Five H.S.'s to spec. depts., each at rate of £50., also res. cas. O., £150.
*Market Drayton, Cheshire Joint Sanat.*—Third asst. M.O., £250.
*Newcastle-upon-Tyne City and County.*—H.P.s and H.S.s for Newcastle General Hospital at rate of £150, H.P.s and H.S.s at Shotley Bridge Emergency Hosp. at rate of £200, also res. med. asst. at Barrasford Sanatorium, at rate of £250.
*Newcastle-upon-Tyne Hospital for Sick Children.*—Temp. hon. ophthal. S.
*Newcastle-upon-Tyne City and County, Newcastle General Hosp.*—Res. M.O., £450.
*New Zealand, Otago Hosp. Board, Dunedin.*—Radiotherapist, £1200.
*Norwich, Norfolk and Norwich Hosp.*—H.P., £120.
*Nottingham General Hosp.*—Res. cas. O., at rate of £150.
*Nottinghamshire County Council.*—Second asst. county M.O., £675.
*Portsmouth City.*—Temp. asst. M.O., £600.
*Portsmouth, Portsmouth and Southern Counties Eye and Ear Hosp.*—H.S., at rate of £150.
*Reading, Royal Berkshire Hosp.*—H.S. and H.P., each at rate of £150.
*Royal Free Hospital, Grays Inn Road, W.C.*1.—Asst. M.O., £300.
*Royal Masonic Hosp., Ravenscourt Park, W.6.*—Two res. M.O.'s, each £300.
*Sheffield Children's Hospital.*—Clin. pathologist, £350–£400.
*St. Peter's Hosp. for Stone, &c., Henrietta Street, W.C.*2.—H.S., £75.
*Swanley, Kent, Hosp. Convalescent Home, Parkwood.*—Res. M.O., at rate of £200.
*Swansea General and Eye Hosp.*—Res. anæsthetist, at rate of £150.
*Westminster Hosp., St. John's Gardens, S.W.*1.—Physician.
*West Ham County Borough.*—Asst. R.M.O. at Forest Gate Hospital, £350.
*Willesden General Hospital, N.W.*10.—Hon. phys. to skin dept., also asst. surg. O., £50.

The Chief Inspector of Factories announces a vacant appointment for an examining surgeon at Llanwrtyd Wells, Brecon.

## Medical Diary

*Week beginning April 15*

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1.

THURSDAY

*Neurology*—5 P.M., Dr. Dorothy Russell: Ectopic Pinealomas. Prof. Geoffrey Jefferson: Aneurysm in the Iter of Sylvius; Malignant Pituitary Adenoma. Dr. Samuel Nevin: Histological Changes in the Brain in Diabetic Hypoglycæmia. Dr. A. Meyer: Neuropathological Changes in Pick's Disease. Dr. G. E. Smyth: Histological Lesions in the Cerebellar Dentate.

FRIDAY

*Physical Medicine*—3.45 P.M., Annual General Meeting. Sir Robert Stanton Woods: Organisation of Physical Medicine in the E.M.S. Dr. John Cowan: Physical Treatment of Nerve Injuries. Dr. A. R. Neligan: Balneological Treatment of War Injuries. Dr. Philippe Bauwens: Some Possibilities of Physical Treatment in Infective Complications. Dr. James Mennell: Danger of Treatment by Manipulation in War-time Injuries.

*Obstetrics and Gynæcology*—5 P.M., Mr. Stanley A. Boyd: Radio-opaque Calcification of the Fallopian Tubes with Tubal Patency. Prof. F. J. Browne: Brain showing Cerebral Hæmorrhage in a Case of Spontaneous Labour. Miss Meave Kenny: A Case of Osteomalacia. Miss Gladys H. Dodds and Prof. F. J. Browne: Chronic Nephritis in Pregnancy.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12.

WEDNESDAY.—11.30 A.M., clinico-pathological conference (medical); 3 P.M., clinico-pathological conference (surgical).
THURSDAY.—2 P.M., Dr. Duncan White: radiological conference.
FRIDAY.—2 P.M., clinico-pathological conference (gynæcological); 2.30 P.M., Dr. C. M. Hinds Howell: ward clinic; 2.30 P.M., Mr. V. B. Green Armytage: sterility clinic.
DAILY.—10 A.M.–4 P.M., medical clinics; surgical clinics and operations; obstetrical and gynæcological clinics and operations. 1.30–2 P.M., post-mortem demonstration.

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.

Medical Society of London, 11, Chandos Street, W.1. TUES., 5 P.M., Mr. T. Meyrick Thomas: Intestinal Obstruction. THURS., 5 P.M., Mr. R. A. Fitzsimons: Fractures.—St. Mary's Hospital, Paddington, W.2. WED., 5.30 P.M., clinical F.R.C.S. class.—Royal National Orthopædic Hospital, Brockley Hill, Stanmore. FRI., 2 P.M., F.R.C.S. orthopædic course.—Royal Cancer Hospital, Fulham Road, S.W.3. DAILY, 9.30 A.M., F.R.C.S. course.—Royal College of Surgeons, Lincoln's Inn Fields, W.C.2. WED., 3.30 P.M. and THURS., 3 P.M., F.R.C.S. pathology course (by kind permission of the college).—Brompton Hospital, S.W.3. TUES., 5.30 P.M., THURS., 5 P.M., M.R.C.P. course in chest diseases.—Royal Chest Hospital, City Road, E.C.1. MON., WED., THURS., 5 P.M., M.R.C.P. course in heart and lung diseases.

NATIONAL HOSPITAL, Queen Square, W.C.1.

MONDAY—5 P.M., Dr. E. A. Carmichael: Lesions of the Autonomic Nervous System.
TUESDAY—5 P.M., Mr. Julian Taylor: Craniocerebral Injuries.
WEDNESDAY—5 P.M., Dr. T. A. Ross: Psychoneuroses of War-time.
THURSDAY—5 P.M., Dr. George Riddoch: Injuries to Peripheral Nerves.
FRIDAY—5 P.M., Dr. T. A. Ross: Psychoneuroses of War-time.

ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS.

FRIDAY—5 P.M. (St. Ermin's Hotel, Caxton Street, S.W.1), business meeting. 5.45 P.M., Dr. P. M. D'Arcy Hart, Dr. C. L. Sutherland, Sir Henry Bashford: Tuberculosis and the Industrial Worker.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1.

MONDAY—5.30 P.M., Dr. G. W. B. James introducing a discussion on Anxiety Neurosis.

EUGENICS SOCIETY (at the rooms of the Linnean Society, Burlington House, Piccadilly, W.1).

FRIDAY—5 P.M., Mrs. Eva Hubback, M.A.: Family Allowances.

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2.

TUESDAY—5 P.M., Mr. Gwynne Williams: Affections of the Small Intestine.
WEDNESDAY—5 P.M., Dr. A. J. E. Cave: Applied Anatomy of the Head and Neck.
THURSDAY—5 P.M., Mr. Gwynne Williams: Non-union of Bone.

## Births, Marriages and Deaths

### BIRTHS

AVERY JONES.—On April 5, at Bromley, the wife of Dr. F. Avery Jones—a son.
CAMERON.—On April 6, in Westminster Hospital, the wife of Dr. J. C. Cameron, of South Woodford, Essex—a son.
CHAMBERLAIN.—On April 4, at Hindhead, the wife of Dr. J. Chamberlain—a son.
FIDDIAN-GREEN.—On March 8, at Matatiele, East Griqualand, South Africa, the wife of Dr. W. B. Fiddian-Green—a son.
HULBERT.—On April 3, in London, the wife of Dr. N. G. Hulbert—a son.
KENT.—On April 2, the wife of Dr. Basil Kent, of Eastbourne—a daughter.
WILSON.—On April 4, at Oxford, the wife of Prof. G. S. Wilson—a son.

### DEATHS

HULL.—On April 4, at Southgate, Walter Hull, M.D. Lond., aged 83.
HUNTER.—On April 5, at Brighton, Percy Douglas Hunter, M.R.C.S., aged 66.
WAUGH.—On April 3, at King's Sutton, George Ernest Waugh, F.R.C.S.
WIGAN.—On April 5, at Wadebridge, Clarence Edward Wigan, M.B. Aberd., of Chelsea.

## Appointments

BARNETT, NORMAN, M.B. Belf., senior house-surgeon at Oldham Royal Infirmary.
FALCONER, DORA J. B., M.R.C.S, deputy medical superintendent at South Middlesex Fever Hospital, Isleworth.
LOGAN, J. S., M.B. Lpool, D.P.H., medical officer of health for Southend-on-Sea.
LUMSDEN, R. J., M.B. Glasg., D.P.H., assistant medical officer of health and assistant school medical officer for Ross and Cromarty.
MACFARLANE, G., M.B., emergency surgical officer at the Royal Berkshire Hospital, Reading.
MILNE, G. P., M.B. Aberd., M.R.C.O.G., temporary consultant in obstetrics to the Cumberland county council.
REID, R. G., F.R.C.S., assistant surgical registrar at the Royal Berkshire Hospital, Reading.
TALBOT, GEOFFREY, M.B. Manc., medical superintendent at Lancashire County Mental Hospital, Prestwich.
THOMSON, D. M., M.D. Manitoba, F.R.C.S., resident surgical officer at St. John's Hospital, Lewisham.
*Colonial Service.*—The following appointments are announced: CUMPSTON, H. B., M.B., medical officer, Northern Rhodesia; GRAHAM, H. P., M.B., medical officer, Northern Rhodesia; HARDY, E. A., M.D., D.P.H., health officer, Malaya; NELSON, W., M.B., senior medical officer, Nigeria.
*London County Council.*—The following have been appointed second assistant medical officers in the mental health service:
HERD, J. A., M.B. Manc., D.P.M., at Long Grove Hospital;
MACDONALD, R., M.B., D.P.M., at Bexley Hospital;
MULINDER, E. K., M.B. N.Z., D.P.M., at Tooting Bec Hospital;
MURPHY, THOMAS, M.B. N.U.I., D.P.M., at Cave Hill Hospital; and
SWITZER, S. LE R., M.R.C.S., D.P.M., at Claybury Hospital.
Examining Surgeons under the Factories Act, 1937: Dr. N. J. BOULTON (Hungerford district, county of Berkshire); Dr. G. M. W. HODGES (Deddington district, county of Oxford).

# NOTES, COMMENTS AND ABSTRACTS

## HOSPITAL LIBRARIES

To provide books and magazines for over 1500 hospitals—service and civilian—in this country, and for all hospitals with the B.E.F. in France and in the Middle East, together with hospital ships and convalescent homes and the smallest sick bay, is no mean task; but it is being done. Hospitals in the counties are supplied from county book depôts of the Red Cross hospital library which have been formed since war broke out, and are run voluntarily, free of rent and salaries. The hospitals in London and the B.E.F. hospitals and hospital ships are supplied from the Red Cross hospital library at Queen's Gardens, in London. The organisation and secretarial work is done at the office of the British Red Cross and Order of St. John in Belgrave Square. The librarian side of the work is as important as the book side; for books are of little value unless they can be cared for—indexed, mended, and above all distributed regularly to each patient. Requests for every kind of book, modern and classical, fiction and non-fiction, technical, foreign and so forth, must be met; this needs knowledge and time to carry out the work. Before the Guild of Hospital Librarians came into being sisters, chaplains, and sometimes stewards did their best to grapple with the gifts of books. But now more and more hospitals have libraries run by voluntary librarians, of whom the head librarians have had training. Crowded wards, with all available corners packed out with beds, make accommodation for libraries hard to come by in the emergency hospitals, and thousands of books are housed as well as may be in small cubby holes. Then timber shortage makes shelving and book trolleys difficult to obtain. It is up-hill work, but the gratitude of patients for books, and their disappointment if a ward-round is missed, make it worth while. For the first time the service hospitals have opened their doors to whole-time voluntary librarians, found and trained by the guild. For some of these hospitals librarians volunteer from a distance, and pay their own board and lodging, in addition to giving full-time work. It must be hoped that in a not far distant future libraries and librarians will be considered such an essential part of hospital equipment that provision will be made for them in every non-infectious hospital except the smallest.

## THE APPROACH TO THE PATIENT

IN his paper read to the Medical Society of Individual Psychology on March 14, Dr. Allen Worsley said he recognised two types of patient, irrespective of diagnosis. The coöperative type, who were receptive and submissive were treated on an equality of mutual coöperation. Information was gathered in free-association and classified. In the non-coöperative type resistances were broken down by getting the patient to see obstinacy as an infantile attempt to dominate the parents—i.e., the analyst. Where this failed resistances were broken down by insisting on unhelped free-association and a process of wearing down the patient's defiance against the analyst's patience was adopted. The analyst must be proof against unconscious reaction to the patient's fears, insults, and attempts at exasperation; otherwise the patient sensed this unconsciously and made capital out of it. Severe neuroses, psychoses and bad conversion hysterias, unsuitable for this method, he treated by Freudian analysis of modified type, alone or combined with this method. The success of the method depended more than anything on a sense of understanding in the analyst, which guarded him against attacks, disarming the patient at every turn, and bringing about rapid transference. In other words, his approach was through the heart, not through the head.

## SANATORIUM METHODS

ONE way of finding out what are the fashionable methods of treating pulmonary tuberculosis is to glance through the annual report of an important sanatorium. For such a purpose the reports of Vejlefjord Sanatorium, established by Professor Saugman in Denmark forty years ago, are particularly suitable, for the sanatorium is large (over 80 patients can be treated at the same time) and the outlook of the founder and his successor, Dr. J. Gravesen, is wide. The report for 1939 discloses the fact that the sanatorium, like many others, gets cluttered up with advanced cases. Thus of 140 cases of active pulmonary tuberculosis in adults 99 were severe and 29 moderately severe, only 12 being classed as slight. Some may say that the 35 severe cases discharged much improved and the 35 others discharged improved, had only had their sentence deferred. The average duration of sanatorium treatment in 1939 was 207 days. In 84 patients an artificial pneumothorax was prescribed or actually carried out, and in 33 cauterisation of adhesions was found necessary. As many as 50 patients underwent some thoracoplastic operation or other. Treatment with Sanocrysin is slow in dying out, for in 1939 7 patients were given it. Carbon-arc light baths were prescribed in 39 cases, quartz light baths in 8, and short-wave treatment in 13.

## NEW PREPARATIONS

PROKAYVIT.—Under this name British Drug Houses Ltd. (Graham Street, London, N.1) have issued a synthetic substance (2-methyl-1 : 4-naphthoquinone) chemically related to vitamin K which, it is believed, possesses properties identical with those of the natural vitamin. For use in clinical practice Prokayvit is presented in ampoules each containing 5 mg. in 1 c.cm. of oily solution for intramuscular injection.

CARBACHOL.—This product which was originally made by E. Merck under the name Doryl is now introduced by Burroughs Wellcome and Co. as Carbachol. Its chemical name is carbamycholine chloride, a choline ester having a pharmacological activity similar to that of acetycholine, but much more resistant to hydrolysis. It is exceptionally stable and is effective both by mouth and parenterally. It is issued in four forms: a "tabloid" product of 0·002 g. for oral administration; a "hypoloid" product of 0·25 mg. in 1 c.cm. for subcutaneous or intramuscular injection; as "Wellcome" (ophthalmic) solution of Carbachol of 0·75 per cent. with a dropper; and as "Vaporole" (nasal) solution of 0·05 per cent.

UROPAC.—Under this name Pharmaceutical Specialties (May and Baker), Dagenham, are issuing a preparation of the di-sodium salt of 3 : 5-di-iodo-4-pyridoxyl-N-methyl-2 : 6-dicarboxylic acid containing 51·5 per cent. of iodine. It is used as a contrast medium in intravenous urography and other radiographic investigations; before the outbreak of war this substance was not produced in this country. It is presented in ampoules containing 20 c.cm. of a stable sterile 75 per cent. solution for intravenous injection.

QUEEN TOILET PREPARATIONS.—Under this name Boutall Ltd. (150, Southampton Row, London, W.C.1) have issued a series of toilet preparations. The soap is said to be made from a pure edible fat and to be free from any irritating ingredient.

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RADIOTHERAPY IN WAR-TIME.—Dr. D. W. Smithers writes: In your report of the meeting of the British Institute of Radiology on March 16 I am quoted as saying that 167 cases of gas gangrene had been treated by radiotherapy at my hospital. I said, in fact, that only 167 patients so treated had been recorded in the medical literature, that only 2 had been treated in this country and that I personally had never treated a case.